AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE	OF	PAGES
	1		4

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0001	4 SEP 01		

6. ISSUED BY	CODE	7. ADMINISTERED BY *(If other than Item 6)*	CODE
US ARMY ENGINEER DISTRICT, FORT WORTH ATTN: CESWF-CT (RM 2A19) PO BOX 17300 FORT WORTH, TX 76102-0300			

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*	(X)	9A. AMENDMENT OF SOLICIATION NO.
	☒	DACA63-01-R-0023
		9B. DATED *(SEE ITEM 11)* 15 AUGUST 2001
	☐	10A. MODIFICATION OF CONTRACT/ORDER NO.
		10B. DATED *(SEE ITEM 11)*
CODE / FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☒ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a)By completing items 8 and 15, and returning 1 copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (*Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

The Solicitation for REPAIR RUNWAY 13R - 31L, LAUGHLIN AIR FORCE BASE, TEXAS, is amended as follows:

See Continuation Sheets.

NOTE: Receipt of Proposal Date and time remain "14 September 2001, at 4 p.m. local time," as previously announced.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR *(Signature of person authorized to sign)*	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA *(Signature of Contracting Officer)*	16C. DATE SIGNED

Item 14. Continued.

CHANGES TO THE COVER SHEET.

1. On the cover sheet, change project title from “REPAIR RUNWAY 13L – 31R” to “REPAIR RUNWAY 13R – 31L”.

CHANGES TO SF1442 – SOLICITATION, OFFER AND AWARD

2. Standard Form 1442.- Delete the SF1442, pages 1 and 2 and substitute the accompanying SF1442, bearing the notation "ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-01-R-0023."

CHANGES TO BIDDING SCHEDULE

3. Replace the Bidding Schedule, pages 00010-3 and 00010-4, with the accompanying new Bidding Schedule, bearing the notation "ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-01-R-0023."

CHANGES TO SECTION 00100 INSTRUCTIONS, CONDITIONS, AND NOTICES TO BIDDERS

4. Replace pages 00100-1 and 00100-8 with the revised pages 00100-1 and 00100-8, bearing the notation “Revised by Amendment 0001.”

CHANGES TO SECTION 00120 PROPOSAL SUBMISSION REQUIREMENTS

5. Replace page 00120-1 with the revised page 00120-1, bearing the notation “Revised by Amendment 0001.”

CHANGES TO SECTION 00150 EVALUATION FACTORS FOR AWARD

6. Replace Section 00150, pages 1 and 2 with the revised Section 00150, bearing the notation “Revised by Amendment 0001.”

CHANGES TO SECTION 00700 CONTRACT CLAUSES

7. Replace page 00700-19 with the revised page 00700-19, bearing the notation “Revised by Amendment 0001.”

CHANGES TO THE SPECIFICATIONS

8. New Section. Add the accompanying new Section 01321 – PROGRESS SCHEDULE, bearing the notation "ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-01-R-0023," and add to the Table of Contents.

9. Replacement Sections - Replace the following sections with the accompanying new sections of the same number and title, bearing the notation "ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO.

DACA63-01-R-0023:"

01000	CONSTRUCTION SCHEDULE
01005	SPECIAL PROVISIONS
01420	BASIC STORMWATER POLLUTION PREVENTION PLAN
01451	CONTRACTOR QUALITY CONTROL
01722	MOBILIZATION AND DEMOBILIZATION
02754	CONCRETE PAVEMENTS FOR SMALL PROJECTS
16526	AIRFIELD LIGHTING AND VISUAL NAVIGATION AIDS

10. Deleted Sections.- Delete these sections entirely and delete from the Table of Contents:

01320	PROJECT SCHEDULE
01580	BULLETIN BOARD AND PROJECT SIGN

CHANGES TO THE DRAWINGS

11. On Sheet No. 2 – LOCATION & ACCESS ROUTE PLAN - Change Barricade Note 2, line 4, to read "…See Sheet **4** for..."

12. On Sheet No. 2 – LOCATION & ACCESS ROUTE PLAN - Add Barricade Note 4:

"4. During construction within CAZ #1, a low profile barricade shall be placed across the entire width of Taxiway J 200' off the centerline of Runway 13C-31C. The barricade and Taxiway J closure marker shall be removed upon completion of all work within CAZ #1, with the exception of initial pavement markings."

13. On Sheet No. 2 – LOCATION & ACCESS ROUTE PLAN - Add Barricade Note 5:

"5. Access through the haul route must remain open at all times for the towing of aircraft across the haul route near the Excess Parking Apron. Vehicles must yield to aircraft being towed across the haul route. This may occur 2-3 times per day maximum."

14. On Sheet No. 2 – LOCATION & ACCESS ROUTE PLAN - Change General Note 3, line 2, to read "…Taxiway G. Flag person shall be stationed at this location at all times during Contractor work operations."

15. On Sheet No. 2 – LOCATION & ACCESS ROUTE PLAN - Add attached Sketch Nos. 0001-01 and 0001-02.

16. On Sheet No. 3 – CONSTRUCTION PHASING PLAN - Delete Phasing Notes 3, 4, 5, & 7.

17. On Sheet No. 3 – CONSTRUCTION PHASING PLAN - Add Special Note:

"SPECIAL NOTE: At no time, other than period between 22 Dec 01 and 2 Jan 02, or pre-approved weekends, can taxiway G be shut down."

18. On Sheet No. 3 – CONSTRUCTION PHASING PLAN - Change Phasing Note 6, line 1 to read:

"Initial pavement marking, except Taxiway G centerline, shall not be…"

19. On Sheet No. 4 – BARRICADE DETAILS – Delete plastic flagging from details and revise Typical Drum Fence Barricade spacing from 15 feet to 10 feet. Revise note 3 to read: "…at 10 –foot maximum intervals…." Delete Note 4.

20. On Sheet No. C-36 – REPLACEMENT SECTIONS – Replace Taxiway E / Taxiway G Intersection Detail with detail on attached Sketch No. 0001-03.

END OF AMENDMENT

SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NUMBER	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES
	DACA63-01-R-0023	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	15 AUG 2001	1 of 2

IMPORTANT - The "offer" section on the reverse must be fully completed by the offeror.

4. CONTRACT NUMBER	5. REQUISITION/PURCHASE REQUEST NUMBER	6. PROJECT NUMBER
	W45XMA11942165	

7. ISSUED BY CODE DACA63

US ARMY ENGINEER DISTRICT, FORT WORTH
ATTN: CONTRACTING DIVISION
POST OFFICE BOX 17300
819 TAYLOR STREET, ROOM 2A19
FORT WORTH, TEXAS 76102-0300

8. ADDRESS OFFER TO

(See Block 7)

9. FOR INFORMATION CALL ▶	A. NAME	B. TELEPHONE NUMBER (Include area code) (NO COLLECT CALLS)
	ROBERT D. PETRAVAGE	(817) 978-3391 FAX:(817)978-4547

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS *(Title, identifying number, date):*

SOLICITATION NO. DACA63-01-R-0023, Repair Runway 13R-31L, Laughlin AFB, Texas. [AM #1]

Contract Specialist E-Mail: robert.d.petravage@swf02.usace.army.mil

11. The Contractor shall begin performance within 10 calendar days and complete it within * calendar days after receiving

☐ award, ☒ notice to proceed. This performance period is ☒ mandatory, ☐ negotiable. *(See* *Section 01000 *.)*

12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE PAYMENT BONDS? *(If "YES," indicate within how many calendar days after award in Item 12B.)*	12B. CALENDAR DAYS
☒ YES ☐ NO	10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

A. Sealed offers in original and 0 copies to perform the work required are due at the place specified in Item 8 by 4:00 p.m. *(hour)* local time 14 September 2001 *(date).* If this is a sealed bid solicitation, offers will be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.

B. An offer guarantee ☒ is, ☐ is not required.

C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.

D. Offers providing less than 90 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

OFFER *(Must be fully completed by offeror)*

14. NAME AND ADDRESS OF OFFEROR *(Include ZIP Code)*

E-MAIL:
CAGE: DUNS:
CODE FACILITY CODE

15. TELEPHONE NUMBER *(Include area code)*
FAX:

16. REMITTANCE ADDRESS *(Include only if different than Item 14)*

17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within _____ calendar days after the date offers are due. *(Insert any number equal or greater than the minimum requirement stated in 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)*

AMOUNTS ▶ AS SET FORTH IN THE ATTACHED BIDDING SCHEDULE

18. The offeror agrees to furnish any required performance and payment bonds.

19. ACKNOWLEDGEMENT OF AMENDMENTS
(The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)

AMENDMENT NO.										
DATE										

20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*

20B. SIGNATURE

20C. OFFER DATE

AWARD *(To be completed by Government)*

21. ITEMS ACCEPTED

22. AMOUNT

23. ACCOUNTING AND APPROPRIATION DATA

24. SUBMIT INVOICES TO ADDRESS SHOWN IN ▶ *(4 copies unless otherwise specified)*
ITEM

25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO
☐ 10 U.S.C. 2304(c) ( ) ☐ 41 U.S.C. 253(c) ( )

26. ADMINISTERED BY CODE

U.S. ARMY ENGINEER DISTRICT, FORT WORTH
SAN ANTONIO AREA OFFICE
ATTN: CESWF-AO-S
4204 WOODCOCK, SUITE 245
SAN ANTONIO, TEXAS 78228-1319

27. PAYMENT WILL BE MADE BY

US ARMY CORPS OF ENGINEERS FINANCE CENTER
ATTN: CEFC-AO
5722 INTEGRITY DRIVE
MILLINGTON, TN 38054-5005

CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE

☐ 28. NEGOTIATED AGREEMENT *(Contractor is required to sign this document and return _____ copies to the issuing office.)* Contractor agrees to furnish and deliver all items or perform all work requirements identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications incorporated by reference in or attached to this contract.

☐ 29. AWARD. *(Contractor is not required to sign this document.)* Your offer on this solicitation is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.

30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN *(Type or print)*

31A. NAME OF CONTRACTING OFFICER *(Type or print)*

30B. SIGNATURE

30C. DATE

31B. UNITED STATES OF AMERICA
BY

31C. AWARD DATE

ACCOMPANYING AMENDMENT NO. 0001 TO SOLICITATION NO. DACA63-01-R-0023
[AM #1] Repair Runway **13R – 31L** (Title)
Laughlin AFB, Texas (Location)

Solicitation No.DACA63-01-R-0023

BIDDING SCHEDULE
(To be attached to SF 1442)

Item No.	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
0001	Hot-Mix Asphalt (HMA)	30,100	Tons	$_____	$_____
0002	Repair Runway 13R-31L All other work, complete	Job	Sum	***	$_____
0003	Mobilization and Demobilization	Job	Sum	***	$_____
0004	Final Record Drawings	Job	Sum	***	$14,000.00
			TOTAL		$_____

NOTES:

1. ARITHMETIC DISCREPANCIES (EFARS 14.407-2)

(a) For the purpose of initial evaluation of bids, the following will be utilized in resolving arithmetic discrepancies found on the face of the bidding schedule as submitted by bidders:

(1) Obviously misplaced decimal points will be corrected;

(2) In case of discrepancy between unit price and extended price, the unit price will govern;

(3) Apparent errors in extension of unit prices will be corrected; and

(4) Apparent errors in addition of lump-sum and extended prices will be corrected.

(b) For the purpose of bid evaluation, the Government will proceed on the assumption that the bidder intends his bid to be evaluated on the basis of the unit prices, the totals arrived at by resolution of arithmetic discrepancies as provided above and the bid will be so reflected on the abstract of bids.

BIDDING SCHEDULE (cont)

NOTES: (cont)

(c) These correction procedures shall not be used to resolve any ambiguity concerning which bid is low.

2. If a modification to a bid based on unit prices is submitted, which provides for a lump sum adjustment to the total estimated cost, the application of the lump sum adjustment to each unit price in the bid schedule must be stated. If it is not stated, the bidder agrees that the lump sum adjustment shall be applied on a pro rata basis to every unit price in the bid schedule.

3. Bidders must bid on all items.

4. Costs attributable to Division 01 - General Requirements are assumed to be prorated among bid items listed.

5. Responders are advised that this requirement may be delayed, cancelled or revised at any time during the solicitation, selection, evaluation, negotiation and/or final award process based on decisions related to DOD changes in force structure and disposition of the Armed Forces.

[AM #1]

END OF BIDDING SCHEDULE

LOCAL INSTRUCTION

PROJECT INFORMATION

For technical information regarding plans and specifications contact Fort Worth District Office, Corps of Engineers, Fort Worth, Texas, telephone, 817/978-2287.

For information regarding bidding procedures or bonds, contact Robert Petravage via telephone 817/978-3391; via email Robert.D.Petravage@swf02.usace.army.mil; or visit Room 2A19, 819 Taylor Street, Fort Worth, Texas. Collect calls not accepted.

Offers will NOT be publicly opened. Information concerning the status of the evaluation and/or award will NOT be available after receipt of proposals.

GENERAL NOTICES

Offerors must provide full, accurate, and complete information as required by this solicitation and its attachments. The penalty for making false statements in Offers is prescribed in 18 USC 1001. (FAR 52.214-4)

The Affirmative Action Requirement of the Equal Opportunity Clause may apply to any contract resulting from this RFP.

FACSIMILE BIDS

The fax number listed in the provision 52.214-31, Facsimile Bids, is available for use by all bidders and offerors on a "first come, first served" basis and is, therefore, subject to heavy use for long periods of time. Accordingly, bidders are cautioned that "last minute" bids may be received late due to heavy message traffic. The government assumes no responsibility for such late bids.

BID GUARANTEE

Reference the provision 52.228-1, Bid Guarantee. Facsimile Bonds are not acceptable.

OFFEROR'S QUALIFICATIONS

Pursuant to FAR 9.1, before an offer is considered for award, the offeror will be requested by the Government to submit a statement regarding his previous experience in performing comparable work, his business and technical organization, financial resources, and plant available to be used in performing the work.

NOTICE REGARDING POTENTIAL EMPLOYMENT ON MILITARY INSTALLATION

If the work called for by this request for proposal is located on a military installation, offerors should check with post/base security to determine if potential employees will be allowed on the base/post to seek employment.

(i) Identification of the law or regulation establishing the price offered. If the price is controlled under law by periodic rulings, reviews, or similar actions of a governmental body, attach a copy of the controlling document, unless it was previously submitted to the contracting office.

(ii) Commercial item exception. For a commercial item exception, the offeror shall submit, at a minimum, information on prices at which the same item or similar items have previously been sold in the commercial market that is adequate for evaluating the reasonableness of the price for this acquisition. Such information may include--

(A) For catalog items, a copy of or identification of the catalog and its date, or the appropriate pages for the offered items, or a statement that the catalog is on file in the buying office to which the proposal is being submitted. Provide a copy or describe current discount policies and price lists (published or unpublished), e.g., wholesale, original equipment manufacturer, or reseller. Also explain the basis of each offered price and its relationship to the established catalog price, including how the proposed price relates to the price of recent sales in quantities similar to the proposed quantities;

(B) For market-priced items, the source and date or period of the market quotation or other basis for market price, the base amount, and applicable discounts. In addition, describe the nature of the market;

(C) For items included on an active Federal Supply Service Multiple Award Schedule contract, proof that an exception has been granted for the schedule item.

(2) The offeror grants the Contracting Officer or an authorized representative the right to examine, at any time before award, books, records, documents, or other directly pertinent records to verify any request for an exception under this provision, and the reasonableness of price. For items priced using catalog or market prices, or law or regulation , access does not extend to cost or profit information or other data relevant solely to the offeror's determination of the prices to be offered in the catalog or marketplace.

(b) Requirements for cost or pricing data. If the offeror is not granted an exception from the requirement to submit cost or pricing data, the following applies:

(1) The offeror shall prepare and submit cost or pricing data and supporting attachments in accordance with Table 15-2 of FAR 15.408.

As soon as practicable after agreement on price, but before contract award (except for unpriced actions such as letter contracts), the offeror shall submit a Certificate of Current Cost or Pricing Data, as prescribed by FAR 15.406-2.

(End of provision)

52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a singe award, firm fixed price contract resulting from this solicitation.

(End of provision)

SECTION 00120
PROPOSAL SUBMISSION REQUIREMENTS

1.0 **PROPOSAL**. Offerors shall strictly adhere to the requirements as set forth in this section when preparing the proposal to be submitted in response to this request for proposal (RFP).

2.0 **PROPOSAL FORMAT**.

2.1 Proposal shall be submitted in **Original plus (2) copies of the following:**

--- Solicitation, Offer, and Award (SF 1442)
--- Bidding Schedule (Section 00010)
--- Bid Bond (Section 0500, SF 24)
--- Representations and Certifications (Section 0600)
--- List of the clients offeror has requested to submit a Past Performance Survey
--- Offerors shall submit a SDB Utilization Plan, to include the following information:

- Identification of each SDB concern proposed and the work each is to perform.
- Targets expressed in dollars and percentages representing each SDB concern's participation of the total contract value.
- Total target value of all SDB participation, expressed in dollars and percentages, of the total contract value.

The offeror is put on notice that that any targets represented in a submitted proposal will be incorporated into and become part of any resulting contract.

All proposed SDB concerns must be SBA-certified in PRO-Net. SDB concerns can register in PRO-Net on the Internet at the following address: http://pronet.sba.gov.

2.1.1 The envelope shall be clearly marked **"RFP No. DACA63-01-R-0023."**

3.0 **PAST PERFORMANCE SURVEY INFORMATION, EXPERIENCE AND PREAWARD INFORMATION.**

3.1 **Past Performance Surveys:** Offeror shall provide information pertaining to no less than three (3) and no more than five (5) active/completed (within the last 5 years) Federal, State and local Government, and/or private contracts performed by the Offeror that are **similar in nature to the requirements in the RFP currently being evaluated.** No more than one past performance survey form per project will be evaluated. Offerors shall provide the survey forms at the end of this section (5 pages) directly to the clients the offeror desires to use as references. To be considered, the past performance survey forms must be **completed by the client** and **mailed or faxed by the client** directly to the Contracting Officer, Barbara Zimmer, fax 817/978-4547 to arrive by 4:00 p.m. Central Time on the date established for receipt of proposal. Past Performance Surveys submitted directly by the offeror will **not** be considered.

3.1.1 The offeror is to submit with his offer, the name, phone number, fax number, and e-mail address of each individual/client the offeror has requested to complete a Past Performance Survey.

3.2 Construction Contract Appraisal Support System (CCASS) reports will be used by the

SECTION 00150
EVALUATION FACTORS FOR AWARD

1.0 BASIS FOR AWARD. The Government intends to award one (1) contract, based upon initial offers received, without discussion of such offers. Each offer should contain the offeror's best terms. The Government will evaluate price and past performance. When combined, all non-cost/price factors are approximately equal to cost or price. The Government reserves the right to conduct discussions if later it is determined by the Contracting Officer to be necessary. The right is reserved to accept other than the lowest offer and to reject any or all offers. As proposals become more equivalent, cost consideration becomes more significant and may become the determining factor for award. Any award price must be determined to be fair and reasonable.

2.0 PRICE/COST PROPOSAL

2.1 A price analysis will be completed of the offeror's ***price/cost*** proposal ***as submitted on the bidding schedule*** to determine price reasonableness. If adequate competition is not obtained, a detailed cost analysis will be used to evaluate for cost realism (allowability, allocability, and reasonableness).

3.0 PAST PERFORMANCE

3.1 For the purpose of evaluating the Past Performance Survey information submitted hereunder:

3.1.1 Past Performance Survey data will be evaluated and scored, as it relates to the probability of the offeror successfully accomplishing the proposed effort.

3.1.2 The Government will use the Past Performance Survey data provided by the offeror (as specified in Section 00120) and data obtained from other sources in addition to these Surveys to perform this assessment.

4.0 SMALL DISADVANTAGED BUSINESS UTILIZATION PLANS

4.1 Small Disadvantaged Business (SDB) Utilization Plans Applies to all offerors

NOTE: Each SDB includes Small Businesses (SB), Small Disadvantaged Businesses (SDB), Woman-Owned Small Businesses (WOSB), HUB Zone Businesses (HUBZone), Veteran-Owned Small Businesses (VOSB), and Historically Black Colleges & Universities/Minority Institutions (where applicable)

4.2 SDB Utilization Plans will be evaluated based on the following:

- The extent to which SDB concerns are specifically identified.
- The extent of commitment to use SDB concerns.
- The complexity and variety of the work SDB concerns are to perform
- Shoe the extent of participation of SDB concerns in terms of the value of the total acquisition.

(End of Section 00150)

solely to the Contractor's determination of the prices to be offered in the catalog or marketplace.

(b) Requirements for cost or pricing data. If the Contractor is not granted an exception from the requirement to submit cost or pricing data, the following applies:

(1) The Contractor shall submit cost or pricing data and supporting attachments in accordance with Table 15-2 of FAR 15.408.

As soon as practicable after agreement on price, but before award (except for unpriced actions), the Contractor shall submit a Certificate of Current Cost or Pricing Data, as prescribed by FAR 15.406-2.

(End of Clause)

52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2000)

(a) It is the policy of the United States that small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns shall have the maximum practicable opportunity to participate in performing contracts let by any Federal agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that its prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the terms of their subcontracts with small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns.

(b) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. The Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor's compliance with this clause.

Definitions. As used in this contract--

HUBZone small business concern means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

Service-disabled veteran-owned small business concern--

(1) Means a small business concern--

SECTION 01000

CONSTRUCTION SCHEDULE
[AM #1]

PART 1 GENERAL

1.1 SCHEDULE

Commence, prosecute, and complete the work under this contract in accordance with the following schedule and Section 00700 CONTRACT CLAUSES COMMENCEMENT, PROSECUTION AND COMPLETION OF WORK and LIQUIDATED DAMAGES:

Item of Work	Commencement of Work (calendar days)	Completion of Work (calendar days)	Liquidated Damages per calendar day
[AM #1]			
(1) All Work excluding CAZ #1, CAZ #2 and CAZ #3	**Within 10 days after receipt of Notice to Proceed***	**15 June 2002**	**$ 100.00**
(2) All Work in Construction Area Zone #1 (CAZ #1) Including Initial Pavement Markings	**01 March 2002**	**30 April 2002****	**$ 290.00**
(3) All Work in Construction Area Zone #2 (CAZ #2) Including Initial Pavement Markings	**01 March 2002**	**30 April 2002**	**$12,185.00**
(4) All Work in Construction Area Zone #3 (CAZ #3) Including Taxiway G Centerline initial Pavement Marking and Excluding Taxiway E ACC Paving, Initial Pavement Markings, and Taxiway Edge Lighting Removals and Replacements	**22 December 2001**	**02 January 2002**	**$10,410.00**
(5) All Work at Taxiway E within Construction Area #3 (CAZ #3) including ACC Paving, Initial	**02 January 2002**	**30 April 2002**	**$ 100.00**

Pavement Markings, and
Taxiway Edge Lighting
Removals and
Replacements

---

* Notice to proceed will not be issued prior to 1 November 2001

** All work in CAZ #1 to be completed within 14 calendar days after commencement

[AM #1]
ACCELERATED PERFORMANCE INCENTIVE

If the contractor completes Item of Work No. 3 - Construction Zone #2 (CAZ #2) earlier than the specified completion date, the contractor shall be paid by the Government $10,000 for each calendar day of early finish, not to exceed a maximum of 15 calendar days.

1.2 SITE VISITS

Site visits will be conducted only on 01 and 08 September 2001 at 1000 hours. Arrangements shall be made with the Laughlin Project Engineer, Mr. Gary Osborne, 830-298-3334. Three day prior notice is required.

1.3 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER (OCT 1989)
(ER 415-1-15)(52.0001-4038 1/96)

a. This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the contract clause entitled "Default: (Fixed Price Construction)." In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

b. The following schedule of monthly anticipated adverse weather delays due to precipitation and temperature is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities. Wind is not considered in the Monthly Anticipated Adverse Weather Calendar Day Schedule.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY
WORK DAYS BASED ON (5) DAY WORK WEEK

DEL RIO, TX AREA (LAUGHLIN AFB AND RESERVE CTRS. WITHIN 80-MILE RADIUS)

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1	1	2	4	3	2	1	3	2	1	2

[AM #1]
DURING THE 7 DAY WORK WEEK, WEATHER DELAY DAYS ARE AS FOLLOWS:

22 Dec 01 - 02 Jan 02 -- 2 days
01 Mar 02 - 30 Apr 02 -- 4 days

c. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day.

The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph "b", above, the Contracting Officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)."

1.4 WORK RESTRICTIONS

1.4.1 Noise Level

Work to be performed is on a runway adjacent to active runways, noise level may be high as jet aircraft may be landing and taking off in the vicinity.

1.4.2 Working Hours

a. Working hours are Monday through Friday, 0700 to 1700 hours.

b. From 22 December 2001 through 02 January 2002 **(when the runways are shut down)**, working hours shall be 24 hours/7 days a week.

c. From 01 March 2002 through 30 April 2002 **(when the runways are shut down)**, working hours shall be 24 hours/7 days a week.

[AM #1]

1.4.3 Submittals

There are some submittals that must be evaluated and approved before the

work can begin at CAZ #3 (scheduled from 22 Dec 2001 - 2 Jan 2002). These must be submitted within 15 days of NTP. Required submittals include but are not limited to:

- 01005-3.3.1 Contractor's proposed work schedule
- 01451-3.2.1 Contractor's Quality Control Plan
- 01330-1.1 SD-01 Pre-construction Submittals
- 01720-3.1 Contractor verification of Contract Survey Data
- 01720-3.2 Plant Layout Drawings
- 02220-1.3 Demolition Work Plan
- 02300-1.3 Qualifications of testing laboratory/facility
- 02721-1.2 Product Data
- 02722-1.2 Product Data
- 02754-1.5 Product Data, Certificates, Paving Schedule
- 02760-1.2 Product Data, Samples
- 02763-1.2 Product Data, Test Reports, Certificates

1.5 UTILITIES

1.5.1 Payment for Utility Services (FAR 36.303(C)(6))

In accordance with Contract Clause 52.236.14 AVAILABILITY AND USE OF UTILITY SERVICES, water, and electricity are available from Government-owned and operated systems and will be furnished without charge to the Contractor **[AM #1], provided it is for general office or tools. Should the Contractor provide an on-site batch plant, it must have it's own power supply. The cost of the fuel to power such plant is the responsibility of the Contractor**.

1.5.2 Outages

The Contractor shall coordinate all requests for utility outages with the Contracting Officer in writing 14 days prior to date of requested outage:

a. Water, gas, steam, and sewer outages shall be held to a maximum duration of 4 hours unless otherwise approved in writing.

b. Electrical outages shall have a maximum duration of 4 hours.

1.6 STREET CLOSINGS

The Contractor shall coordinate all requests for street closings with the Contracting Officer in writing 14 days prior to date of requested outage:

a. One lane traffic shall be maintained at all times (except that a total closing may be allowed for specific 8-hour periods).

b. The final street repair shall be completed within 14 days after the start of any street crossing. Any part of the street returned to service prior to final repair shall be maintained smooth with hot-mix cold-lay surface course.

[AM #1]

1.7 PAYMENT FOR MOBILIZATION AND PREPARATORY WORK (DFAR 252.236-7003)(JAN 1997)

(a) The Government will make payment to the Contractor under the procedures in this clause for mobilization and preparatory work.

(b) Payments will be made for actual payments by the Contractor on work preparatory to commencing actual work on the construction items for which payment is provided under the terms of this contract, as follows-

(1) For construction plant and equipment exceeding $25,000 in value per unit (as appraised by the Contracting Officer at the work site) acquired for the execution of the work;

(2) Transportation of all plant and equipment to the site;

(3) Material purchased for the prosecution of the contract, but not to be incorporated in the work;

(4) Construction of access roads or railroads, camps, trailer courts, mess halls, dormitories or living quarters, field headquarters facilities, and construction yards;

(5) Personal services; and

(6) Hire of plant.

(c) Requests for payment must include-

(1) An account of the Contractor's actual expenditures;

(2) Supporting documentation, including receipted bills or copies of payrolls and freight bills; and

(3) The Contractor's documentation-

(i) Showing that it has acquired the construction plant, equipment, and material free from all encumbrances;

(ii) Agreeing that the construction plant, equipment, and material will not be removed from the site without the written permission of the Contracting Officer; and

(iii) Agreeing that structures and facilities prepared or erected for the prosecution of the contract work will be maintained and not dismantled prior to the completion and acceptance of the entire work, without the written permission of the Contracting Officer.

(d) Upon receiving a request for payment, the Government will make payment, less any prescribed retained percentage, if-

(1) The Contracting Officer finds the-

(i) Construction plant, material, equipment, and the mobilization and preparatory work performed are suitable and necessary to the efficient prosecution of the contract; and

(ii) Preparatory work has been done with proper economy and efficiency.

(2) Payments for construction plant, equipment, material, and structures and facilities prepared or erected for prosecution of the contract work do not exceed-

(i) The Contractor's cost for the work performed less the estimated value upon completion of the contract; and

(ii) 100 percent of the cost to the contractor of any items having no appreciable salvage value; and

(iii) 75 percent of the cost to the contractor of items which do have an appreciable salvage value.

(e)(1) Payments will continue to be made for item no. _____, and all payments will be deducted from the contract price for this item, until the total deductions reduce this item to zero, after which no further payments will be made under this item.

(2) If the total of payments so made does not reduce this item to zero, the balance will be paid to the Contractor in the final payment under the contract.

(3) The retained percentage will be paid in accordance with the Payments to Contractor clause of this Contract.

(f) The Contracting Officer shall determine the value and suitability of the construction plant, equipment, materials, structures and facilities. The Contracting Officer's determinations are not subject to appeal.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

-- End of Section --

SECTION 01005
SPECIAL PROVISIONS

INDEX

SECTION 01005
SPECIAL PROVISIONS
[AM #1]

PART 1. GENERAL

1.1. LOCATION OF WORK

This work is on the runway and taxiways at Laughlin AFB, TX.

1.2. EQUIPMENT PARKING

Space for the Contractor's equipment and materials shall be as shown on drawings. The Government shall not be liable for the security of any of the Contractor's equipment or material while on **[AM#1] LAFB**.

PART 2. PRODUCTS

The products to be used in the work under this contract are described in the other sections of these specifications.

PART 3. EXECUTION

3.1. TRAFFIC CONTROL

The Contractor shall provide all traffic control devices within the project limits and on all haul routes. The Contractor will be responsible for maintaining all areas of new construction until accepted by the Government.

[AM #1] One lane traffic shall be maintained at all times; at least two flagmen will be on duty to assist traffic in the open lane, when other lanes are closed due to the Contractor's operations. Flagmen will meet the requirements of Item 7.7 of the Texas State Department of Highways and Public Transportation Standard Specifications for Construction of Highways, Streets, and Bridges, 1982 Ed.

3.2. HAULING MATERIAL

Material will be hauled in vehicles equipped with pneumatic tires. Hauling of materials shall comply with state and local regulations, including seasonal load limitations. The Contractor shall be responsible for establishing and maintaining on-Base and off-base haul routes. Haul routes to the individual zones shall be as shown on the drawings. Access to the Contractor's staging area shall be as shown on the drawings.

3.3. WORK CONDUCT, CORRELATION, EXECUTION, ETC.

3.3.1. Work Performance

Contractor shall conduct all work, including materials distribution in an orderly manner with minimum disturbance and inconvenience to traffic operations. Contractor shall confine and limit his personnel to only those areas required for work performance. All work shall be performed in a neat, orderly fashion, with extreme care exercised to avoid damage to all property in and around project areas. Any damage caused by the Contractor shall be replaced, repaired, or restored at no cost to the Government. Upon completion, all work and storage areas shall be cleaned of all evidence of Contractor's debris

accumulations. Contractor's proposed work schedule shall be coordinated with Airfield Management and the Contracting Officer or his designated representative 14 days prior to the start of any work. All work areas shall be barricaded properly for day and nighttime vehicular safety warning.

3.3.2. Storage

At the close of each day's operations, all excess materials and equipment shall be moved to storage area designated by Contracting Officer or his designated representative. If Contractor should have storage structure or equipment located on base, it shall be removed, and storage area restored to its original condition within twenty-one days after final inspection of this project.

3.4. PERMITS AND WORK CLEARANCES

The Contractor shall obtain from the Contracting Officer's representative a copy of the AF Form 103, "Base Civil Engineering Work Clearance Request" prior to start of work.

3.5. SWEEP AIRFIELD PAVEMENTS

Airfield pavement shall be continuously cleaned with a vacuum sweeper suitable for airfield pavement cleaning at all times. Debris that may result in foreign object damage shall be removed. Airfield pavements used as haul routes shall be continuously cleaned by the Contractor.

3.6. LIGHTING FOR NIGHT WORK

The Contractor will be responsible for providing light fixtures and a power source. The Contractor shall coordinate night time lighting with the Base Airfield Manager through the Contracting Officer.

3.7. RADIO COMMUNICATIONS

The Contractor shall provide radio communication devices including chargers (minimum 3) for communications between the Contractor, Contracting Officer and Using Service for controlling runway operations. The communication devices shall be capable of operating on a frequency band of 149.225 MHz. Exact operating frequency shall be provided by the Contractor to the Contracting Officer at the pre-construction conference. Radio communications shall be maintained at all times while work is being accomplished at the site. The contractor shall coordinate any additional frequencies, which the contractor wishes to use for business communications, through the Contracting Officer to the Base at the pre-construction conference.

SECTION 01321

PROGRESS SCHEDULE
[AM #1]

PART 1 GENERAL (Not Applicable)

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 CONSTRUCTION PROGRESS CHART

Pursuant to the contract clause entitled "SCHEDULE FOR CONSTRUCTION CONTRACTS" the Contractor shall prepare a schedule of construction utilizing a construction progress chart as described herein. Construction progress charts shall be prepared on ENG Form 2454. The Contractor shall submit three (3) copies of the Construction Progress Chart for approval. No progress payments will be made without an approved progress chart.

The Contractor shall prepare the chart with the following considerations:

a. The contract work shall be divided into definable contract features.

b. As a minimum, the Contractor shall address each specification section as a principle contract feature.

c. The weighted value (WT.) column should indicate the percentage of the contract for which each principle contract feature accounts.

d. The vertical lines shall be identified by specific time frames, (i.e., weekly, bi-weekly, monthly) with one space accounting for no more than one month.

e. Identify the date when Notice to Proceed is acknowledged on the chart.

f. Identify the contract completion date on the chart.

The Contractor shall place bars on the chart to indicate scheduled progress for each feature of work. The Contractor shall note the anticipated percentage complete for each item at the end of each month and at the end of each scheduled block. Activities shall be identifiable by bid item if applicable.

-- End of Section --

CONSTRUCTION PROGRESS CHART

REPORTS CONTROL SYMBOL

1. CONTRACTOR	3. PROJECT	5. CONTRACT DESCRIPTION	6. SUBMITTED FOR APPROVAL	DATE
			7. APPROVAL RECOMMENDED	DATE
2. CONTRACT NUMBER	4. LOCATION		8. APPROVED	DATE

LEGEND
BARS: 0 5 10
Scheduled progress to date of report
Actual progress
CURVES:
Scheduled progress _____ Actual progress .....

PRINCIPAL CONTRACT FEATURE	LINE ITEM	WT.	ESTIMATED COST	
				SCHED. ACTUAL

100 90 80 70 60 50 40 30 20 10 0

SECTION 01420

BASIC STORMWATER POLLUTION PREVENTION PLAN
[AM #1]

PART 1 GENERAL

1.1 SUMMARY

This Section provides a basic Stormwater Pollution Prevention Plan (SWPPP) for a National Pollutant Discharge Elimination System (NPDES) General Permit.

1.2 PROJECT IDENTIFICATION AND NOTES

PROJECT TITLE: REPAIR RUNWAY 13R - 31L **[AM #1]**

LOCATION: LAUGHLIN AIR FORCE BASE , TEXAS

Each project location shall require a separate NPDES General Permit (and separate SWPPP). The basic SWPPP shall not limit the Contractor's ability to determine construction and stabilization methods and their phasing. It shall not include any specific contractual information such as quantities and costs unless it is necessary for Environmental Protection Agency (EPA) to comprehend the pollution prevention measures. The SWPPP shall discuss the pollution control structures, temporary and permanent stabilization methods in the narrative with detailed information provided in the technical specifications, structural control locations, types and typical details on contract drawings. The SWPPP narrative and contract drawings shall be submitted to the Government for review.

1.3 PROJECT DESCRIPTION

Provide a short summary of the project and the construction activities associated with it (i.e. clearing and grubbing; grading; concrete and asphalt pavement; fencing; landscaping; necessary site work and utility service lines; and demolition, recycling and disposal of regulated substances, etc). Identify the total project area (acres or hectares) for the proposed construction and the existing demolition sites. Identify the total disturbed area including the construction right-of-way. For example, a barracks rebuild project may have a project area of 3 hectares, but only 2 hectares will be disturbed ground surface.

1.4 STANDARD INDUSTRIAL CLASSIFICATION (SIC)

Determine the SIC codes by reference book titles Standard Industrial Classification Manual published by Office of Management and Budget (OMB). For construction activity permit, the primary and sometimes the secondary codes will be for the construction activity. The second through the fourth codes will generally relate to the ultimate use of the project. Use one

(1) to maximum of four (4) codes as needed to adequately describe the project.

For example:
A. 1521 General Contractors - Single Family Houses

B. 1542 General Contractors - Non-Residential Building, other then Industrial Buildings and warehouses

C. 1771 Concrete Work (includes asphalt, i.e. access drives and parking lots, culvert construction)

D. 1623 Water, Sewer, Pipeline, and Communications and Power Line Construction

1.5 LOCATION

Provide a narrative description of the project location. If possible, include street names or easily recognized landmarks. This paragraph must at least include one of the following: (1) street name of the project, (2) latitude and longitude of the project center to the nearest 15 seconds, or (3) quarter, section, township, and range in which the project is located.

1.6 RECEIVING WATERS

Identify the body of water which will receive runoff from the site. If it is a tributary to a major river, identify the tributary and the river into which it flows. If the runoff is collected by a storm drainage system, identify the operator of the system (i.e. the name of the base or municipality) and the ultimate receiving water. An arrow showing direction to the receiving waters should be labeled on the grading and drainage plans.

PART 2 SITE DESCRIPTION

2.1 EXISTING CONDITIONS

This subsection will be similar to the site description paragraph in the Civil Design Analysis. Describe the current site conditions. Include information on drainage patterns and runoff coefficients. Also discuss the design storm frequencies used for runoff volume calculations. If the site is located adjacent to an existing industrial facility or in a community greater than 100,000 people, records of storm water quality near your site may be available. Contact the appropriate military base or municipality and include any available data in this subsection.

2.2 FUTURE CONDITIONS

Describe the site conditions which will exist upon the completion of construction activities. Include estimates of future runoff coefficients. Concentrate on features which affect storm water volume and drainage. Detailed information about pavement sections, handicap access, parking spaces, fence type, etc. is not necessary unless it impacts runoff.

2.3 CONSTRUCTION PHASING

Describe the project start and completion dates. Describe the sequence of MAJOR activities associated with the project.

For example:

Major Construction Activities for Family Housing

A. Clearing and Grubbing - (NOTE: The SWPPP designer shall discuss limit of clearing and grubbing or indicate that it has been delineated on the SWPPP drawing.)

B. Grading and Drainage - (NOTE: The SWPPP designer shall discuss grading for positive removal of most storm water from site via sheet flow into the new trench drain, sidewalk drains and curb gaps, and eventually empties into the existing storm drainage system.

C. Construction Phasing - (NOTE: The SWPPP designer shall discuss the major construction phasing activities.)

D. Site Stabilization - (NOTE: The SWPPP designer shall discuss method to be used for temporary and permanent stabilization.)

Major Construction Activities for Building Demolition

A. Removal, Recycling, or Disposal of regulated materials prior to demolition. (NOTE: The SWPPP shall discuss the regulated materials and their sequence of removal and disposal in this project.)

B. Demolition - (NOTE: The SWPPP designer shall discuss all demolition needed for site, electrical, mechanical, environmental, etc.)

C. Grading and Drainage - (NOTE: The SWPPP designer shall discuss restoration to existing grade and drainage pattern.)

D. Site Stabilization - (NOTE: The SWPPP designer shall discuss method used for permanent stabilization.)

2.4 SOILS DATA

Provide the following soils information about this site. Possible sources of information are soil borings and USDA soil survey data or other published sources. Also cite the source of quantitative and qualitative data (e.g. Soil Survey of El Paso County, Texas, issued November 1971 by the United States Department of Agriculture, Soil Conservation Service).

2.5 DRAWINGS

Identify drawing sheet number, and title of sheet. Also attach a copy of each referenced sheet when submitting the SWPPP for Government review.

The site map or maps should be clear enough to interpret the following: Drainage patterns; appropriate slopes after major grading; area of soil

disturbances (in most cases, it is the same as grading limits or construction right-of-way); outline of areas not to be disturbed during construction (i.e. vegetative buffer zones, cultural resources, wetlands, and area of environmental concern); location of major structural and non-structural storm water controls; areas where temporary stabilization practices are expected to occur; surface water locations (NOTE: If the site is not adjacent to surface water, indicate the general direction of flow to nearest surface water with a "directional arrow" on map and identify that water way as lake, stream, creek, river, unnamed tributary of named receiving stream, etc.); and storm water discharge location. Flow directional arrows shall be shown on grading maps to indicate flow pattern. If permanent stabilization includes establishment of turf, indicate the area to be stabilized by turf. If this area is equivalent to the grading limits or construction right-of-way, a statement of that fact in this subsection is sufficient.

PART 3 EROSION AND SEDIMENT CONTROLS

3.1 TEMPORARY STABILIZATION

Discuss acceptable methods for stabilization of soil which will be exposed for longer than 21 days during construction activities.

3.2 PERMANENT STABILIZATION

This subsection primarily consists of the final landscaping and turfing plan.

3.3 TEMPORARY SEDIMENT BASINS

Identify whether or not a basin will be used. If a basin is not needed or is unattainable, provide justification. If a basin is to be used, include the design in the contract specifications and drawings. The basin should be capable of storing 101.88 cubic meters (77.8 cubic yards) (or use Metric or English units to match the project requirements) of water for every hectares (or acres) within the drainage area, unless justification is provided for the use of other criteria. Where attainable, the EPA regulation requires a temporary sediment basin for sites where 4.047 or more hectares (10 acres) are disturbed at one time. A temporary sediment basin may not be attainable if land adjacent to the construction site is not available for use as a basin, if runoff from site does not drain to a common collection point, or if difficult site conditions result in the cost of the basin being prohibitive.

3.4 STRUCTURAL CONTROLS

Use as many subsections as necessary to adequately describe erosion and sediment control used during construction. Possible subsections include SILT FENCES, CHECK DAMS, EARTH DIKES, and etc. Include typical details of the structural control details in the contract drawings and submittal with SWPPP.

PART 4 STORM WATER MANAGEMENT CONTROLS

4.1 RUNOFF COMPUTATIONS

The number and headings of these subsections will vary significantly from project to project. Use as many subsections as necessary to adequately describe erosion and sediment controls for the completed project. While designing the site layout and grading plans, the design engineer should include features that will limit erosion and control sedimentation once project construction has been completed. Permanent structures may be curbs and gutters, storm drains, drainage ditches, culverts, pavement slopes, etc. Indicate storm frequencies and durations used for design purposes. Subsections may include, but are not limited to: RUNOFF COMPUTATIONS, STORM DRAINAGE SYSTEM, VEGETATIVE BUFFER STRIPS, DRAINAGE SWALES AND DITCHES, DRAINAGE CULVERTS, and all the subsections discussed in paragraph 3.0 EROSION AND SEDIMENT CONTROLS. All sites for new construction and demolition shall be separately addressed. Units of measure used shall match the construction project.

4.2 OUTFALL VELOCITY DISSIPATION DEVICES

Specifically identify any velocity dissipation devices used to provide non-erosive flow conditions at the point of storm water discharge to receiving waters. If no energy dissipators are used, explain why they are not necessary. All sites for new construction and demolition shall be separately addressed.

PART 5 BEST MANAGEMENT PRACTICES (BMP) DURING CONSTRUCTION

The Contractor, or its subcontractors, shall be responsible to minimize pollution of storm water runoff. The Contractor shall discuss BMP in detailed SWPPP. They shall comply with the BMP to minimize stormwater pollution.

5.1 WASTE MATERIALS

Solid waste materials (trash and construction debris) shall be placed in covered and appropriate waste containers . Waste containers shall be emptied regularly; they shall not be allowed to overflow. The disposal area of excavated material from project construction shall not be utilized for waste disposal. Routine janitorial service shall be provided for all construction buildings and surrounding grounds. No construction waste materials, including concrete, shall be buried or otherwise disposed of on-site. All site personnel shall be briefed on the correct procedures for solid waste disposal. Asbestos-containing materials shall be handled and disposed of per specification section ASBESTOS ABATEMENT prior to building demolition.

5.2 HAZARDOUS WASTE

All hazardous waste shall be handled, stored, and disposed in accordance with all Federal, State, and local regulations and prior to all other construction activities. Chemical waste shall be stored in clearly labeled, corrosion-resistant containers, and stored in designated areas before removal from the site. Materials in excess of job requirements shall not be stored on-site. All site personnel shall be briefed on the

correct procedures for hazardous waste disposal. All buildings to be demolished under this contract shall require removal of the following regulated materials: fluorescent lights, ballasts, items containing ozone depleting chemicals, mercury bulb thermostats, leaded pipe joints, asbestos-containing building material.

5.3 SANITARY WASTE

On-site sanitary facilities shall be established. Facility location, design, maintenance, and waste collection practices shall be in accordance with local regulations. Temporary parking area(s) to be used 30 calendar days or more for the Contractor's equipment or personal vehicles shall be paved with temporary asphalt per specification and it shall be removed by the Contractor upon project completion.

5.4 OFF-SITE VEHICLE TRACKING AND DUST

Describe practices to keep vehicles from tracking soils from the project construction, material borrow and disposal sites. Describe practices for dust control (i.e. sprinkling, chemical treatment, light bituminous treatment, or similar methods). Describe practice in hauling construction material or debris (i.e. open-bed vehicles shall be covered or otherwise stabilized to avoid their loss during transport).

5.5 FERTILIZERS

If fertilizers are used they shall be applied in , in the stated amounts as recommended by the manufacturer and only when weather conditions are appropriate.

5.6 CONSTRUCTION VEHICLE MAINTENANCE AND REPAIR

Specific areas shall be designated for equipment maintenance and repair to minimize potential impact on storm runoff. Locations shall be chosen to minimize potential impacts on receiving streams and waterways. These locations shall be approved by the Contracting Officer, and structural controls shall be provided. All construction vehicles shall be regularly inspected for leaks and receive regularly scheduled maintenance to reduce the potential for leaks.

5.7 VEHICLE FUELING

Vehicle fueling at project site shall be conducted in accordance with good safety practices to reduce the potential for leaks and spills. Only properly constructed fuel containers shall be used on-site and shall be labeled and stored in accordance with applicable Federal, State, and Local codes. Washing and curing waters shall be drained into a retention basin constructed by the Contractor. It shall be cleaned up by the Contractor, to the satisfaction of the Contracting Officer, after project completion.

PART 6 TIMING OF CONTROLS AND ACTIVITIES.

Discuss the sequence of major activities and how they are related to the pollution prevention measures. Identify situations which are critical to

successful construction and pollution prevention, but will not limit the Contractor's ability to determine construction phasing schedule.

PART 7 COMPLIANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS

Identify what has been done to comply with the National Environmental Policy Act of 1969, as amended.

Army Regulation 200-1 requires that all Department of Defense installations and Contractors are required to comply with Federal environmental protection statutes, which include a provision to observe State, and local environmental regulations. (NOTE: The SWPPP shall discuss documentation in compliance with the National Environmental Policy Act of 1969, as amended.)

In compliance with the Clean Water Act, a construction site of 5.0 acres in size, or above, is required to obtain a National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities. The Federal Register Notice is published in Volume 63, Number 128, July 6, l998.

PART 8 MAINTENANCE AND INSPECTION PROCEDURES

The Contractor shall perform quality control on-site. All pollution prevention structural controls measures shall be inspected at least once every seven (7) days and within twenty-four (24) hours following any storm producing [6 inches][0.5 inches] or more of rainfall. The inspector shall thoroughly understand the requirements of the Contractor's SWPPP and shall have a basic knowledge of the engineering principles for reducing runoff pollution.

Temporary stabilization or grading shall be inspected for erosion and soil loss from the site. Temporary erosion control measures shall be inspected for bare spots and washouts. Discharge points shall be inspected for signs of erosion or sediment. Locations where vehicles enter and leave the site shall be checked for signs of off-site sediment tracking, including erosion control structureat material borrow, disposal, and stockpiled areas. The Best Management Practices and pollution control maintenance procedures shall be reviewed for adequate erosion control by the Contractor during construction. All deficiencies shall be recorded in the Inspection and Maintenance Report posted at the project bulletin board and submit to the Contracting Officer after each inspection. Corrections to these problems shall be implemented within seven (7) calendar days. After final stabilization has been achieved, the Contractor shall inspect the site once a month until final inspection and project acceptance by the Contracting Officer.

PART 9 MATERIAL INVENTORY

All materials or substances brought on-site during construction shall have a Material Safety Data Sheet (MSDS) available to the Contracting Officer. These materials include concrete, paints, sealants, petroleum-based products, cleaning solvents, fertilizers, tar, asphalt, and steel reinforcing bars. The list of materials shall be stated in the

Contractor's detailed SWPPP.

PART 10 NON-STORM WATER DISCHARGE

Non-storm water discharge shall not be allowed during construction of the project except for emergency fire-fighting flows and other flows permitted in accordance with 63 FR 128, July 6, 1998. In addition, any spill of a hazardous substance in excess of reporting quantities shall be reported as required under 40 CFR 110. Spill containment, notification, and clean-up in accordance with applicable Federal, State, and Local regulations, and to the satisfaction of the Contracting Officer shall be required.

PART 11 CONTRACTOR COMPLIANCE

The Contractor shall use this basic SWPPP to prepare a detailed SWPPP that includes both narrative and drawings (Stormwater Control Plans). The detailed SWPPP shall state the following as a minimum: (1) the project start and completion dates, (2) bid options to be executed with the project, (3) sequence of construction activities and pollution control measures, (4) discussion of the Best Management Practices (BMP) and implementation during project execution, (5) identify the list of materials brought on-site, (6) runoff computation of each drainage area (see paragraph 4.1), and (7) revised stormwater control plans to include all locations that require structural controls (i.e. site entrance and exit, staging, stockpiled, borrow, and disposal areas) and the type of storm control structures.

Being responsible for the daily operations at the construction site, the Contractor shall submit the detailed SWPPP (including the revised Stormwater Control Plans), and a Notice of Intent (NOI) for the Stormwater Discharges Associated with Industrial Activity under NPDES General Permit to EPA. The NOI (EPA Form 3510-6) shall be submitted no later than 48 hours before start of construction. A separate NOI is required for each construction contract or each phase of the construction activities. The mailing address for NOI submittal is:

Stormwater Notice of Intent (4203),
USEPA, 401 M Street, SW
Washington, D. C. 20460

The Contractor's detailed SWPPP (including the revised Stormwater Control Plans) and a copy of submitted NOI shall be provided to the Contracting Officer before start of construction. A copy of the U.S. Army Corps of Engineers NOI (obtained from the Contracting Officer), the Contractor's NOI, and a brief project description shall be posted on the project bulletin board. The Contractor's detailed SWPPP shall be kept on-site at all times. During construction, the Contractor shall perform work as required per paragraph, MAINTENANCE AND INSPECTION PROCEDURES in this section.

NO later than 10 working days after acceptance of final stabilization, the Contractor shall submit the Notice of Termination (NOT), EPA Form 3510-7 to EPA. Two copies of the submitted NOT shall be provided to the Contracting

Officer's project file. EPA Forms are available on web site at http://www.epa.gov/earth1r6/6en/w/forms.htm. It is not required but the Contractor may choose to provide the NOT to the Environmental Division of the Fort Worth District. The Environmental Division shall file both the USACE and Contractor's NOT to EPA to facilitate project closeout. The mailing address for the Contractor's prepared and signed NOT is:

ATT: Dr. Hank Jarboe,
CESWF-EV-EE (RM 3A14)
U.S.Army Corps of Engineers
819 Taylor Street
Fort Worth, TX 76102-0300

PART 12 ATTACHMENTS

12.1 OWNER CERTIFICATION

OWNER CERTIFICATION
FOR
(PROJECT TITLE, LOCATION, TEXAS))

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

MICHAEL J. MOCEK, P.E.
DEPUTY DISTRICT ENGINEER

Date Certified:_____

Attachments:

Sheet No.	Title
	VICINITY MAP
	PROJECT LOCATION MAP
	SITE MAP
	STORMWATER CONTROL PLANS
	STORMWATER CONTROL DETAILS

12.2 STORMWATER POLLUTION PREVENTION PLAN

STORMWATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT

INSPECTOR:_____ DATE:_____

INSPECTOR'S
QUALIFICATION:_____

_____

_____

_____

_____

DAYS SINCE LAST RAINFALL:_____ AMOUNT OF LAST RAINFALL:_____INCHES

STABILIZATION MEASURES

_____

AREA	DATE SINCE LAST DISTURBANCE	DATE OF NEXT DISTURBANCE	STABILIZED? (YES/NO?)	STABILIZED WITH	CONDITION

_____

_____

STABILIZATION REQUIRED:

_____

_____

STORMWATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT

TO BE PERFORMED BY:_____ ON or BEFORE:_____

STORMWATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT

OTHER CONTROLS - STABILIZED CONSTRUCTION ENTRANCE

IS MUCH SEDIMENT TRACKED ONTO THE ROAD?	ARE DUST AND SEDIMENT CONTROL MEASURES WORKING?	DOES ALL TRAFFIC USE THE STABILIZED ENTRANCE TO THE SITE?	ARE ASSOCIATED DRAINAGE STRUCTURES WORKING?

MAINTENANCE REQUIRED FOR CONSTRUCTION ENTRANCE:

TO PERFORMED BY:_____ ON OR BEFORE:_____

OTHER CONTROLS - DEVELOP SITE SPECIFIC TABLES AS NEEDED

FOR ALL STABILIZATION MEASURES, STRUCTURAL, AND NON-STRUCTURAL CONTROLS

CHANGES/CORRECTIONS REQUIRED IN POLLUTION PREVENTION PLAN:

REASONS FOR CHANGES:

INSPECTOR'S SIGNATURE:_____ DATE:_____

STORMWATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT

STORMWATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT

MAINTENANCE REQUIRED FOR SEDIMENT BASIN(S):

_____
_____
_____
_____
_____

TO BE PERFORMED BY:_____ ON OR BEFORE:_____

STRUCTURAL CONTROLS - SILT FENCE(S)

FROM	TO	IS THE BOTTOM OF THE FABRIC STILL BURIED?	IS THE FABRIC IN GOOD CONDITION?	HOW DEEP IS THE SEDIMENT?

MAINTENANCE REQUIRED FOR THE SILT FENCE (S):

_____
_____
_____
_____
_____

TO BE PERFORMED BY:_____ ON OR BEFORE:_____

STORMWATER POLLUTION PREVENTION PLAN

INSPECTION AND MAINTENANCE REPORT

STRUCTURAL CONTROLS - EARTH DIKES(S)

FROM	TO	IS DIKED STABILIZED?	IS THERE EVIDENCE OF WASH-OUT OR OVERTOPPING?

MAINTENANCE REQUIRED FOR THE EARTH DIKE(S):

TO BE PERFORMED BY:_____ ON OR BEFORE:_____

-- End of Section --

SECTION 01451

CONTRACTOR QUALITY CONTROL
[AM #1]

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(1994a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(1995b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with quality requirements specified in the contract. The project superintendent in this context shall mean the individual with the responsibility for the overall management of the project including quality and production.

3.2 QUALITY CONTROL PLAN

3.2.1 General

The Contractor shall furnish for review by the Government, not later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 60 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Contracting Officer.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 5 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure contract compliance. The Contractor shall provide a CQC organization which shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer, graduate architect, or a graduate of construction management, with a minimum of one year construction experience on construction similar to this contract or a construction person with a minimum of five years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

3.4.3.1 CQC Staff

A staff shall be maintained under the direction of the CQC system manager to perform all QC activities. The staff must be of sufficient size to ensure adequate QC coverage of all work phases, work shifts and work crews involved with the construction. Except as required for specialized CQC personnel, these personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities.

3.4.3.2 Specialized CQC Personnel

In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: **[AM #1]** electrical, mechanical, and **materials technician**. These individuals shall be directly employed by the prime Contractor and may not be employed by a supplier or sub-contractor on this project; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals may perform other duties but must be allowed sufficient time to

perform their assigned quality control duties as described in the Quality Control Plan.

Experience Matrix

Area & Qualifications

a. Electrical

Graduate Electrical Engineer with 2 yrs related experience or person with 5 yrs related experience

b. Mechanical

Graduate Mechanical Engineer with 2 yrs experience or person with 5 yrs related experience

[AM #1]
c. Concrete, Pavements and Soils

Materials Technician with 2 yrs experience for the appropriate area

3.4.4 Additional Requirement

In addition to the above experience and education requirements the CQC System Manager shall have completed the course entitled "Construction Quality Management For Contractors". This class is mandatory for the Contractor's quality control manager. Certificates issued upon successful completion are valid for five years. This course is periodically offered at the Fort Worth District, Corps of Engineers Office, Federal Building, Room 1A03, 819 Taylor Street, Fort Worth, Texas. Attendees must be fluent in the English language (able to read and write) at the high school level.

Registration is required; call (817) 978-9998 or (817) 978-3870 for times and reservations. There is no charge for the course; however the Contractor will pay for travel and per diem costs.

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERIES

Submittals, if needed, shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures

that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

a. A review of each paragraph of applicable specifications, reference codes, and standards. A copy of those sections of referenced codes and standards applicable to that portion of the work to be accomplished in the field shall be made available by the Contractor at the preparatory inspection. These copies shall be maintained in the field and available for use by Government personnel until final acceptance of the work.

b. A review of the contract drawings.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved. (Only coded A or B shop drawing submittals will be considered "as approved." Submittals other than those coded A or B required to be resubmitted will delay the preparatory phase meeting until they have been resubmitted and approved.)

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

g. A review of the appropriate activity hazard analysis to assure safety requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 72 hours in advance of beginning the preparatory control phase. This phase shall include

a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same

definable features of work if : the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge of $2,000 to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing of Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Government-contract laboratory designated by the Area Office.

Coordination for each specific test, exact delivery location, and dates will be made through the Area Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the Special Contract Requirement Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into

increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.

g. Off-site surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and

instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 12 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

a. Minimum construction quality control report and the required preparatory and initial inspection documentation.

Sample forms enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

SAMPLE FORMS

Sample QC forms follow this page.

(Sample of typical Contractor Quality Control Report)

CONTRACTOR'S NAME
(Address)

DAILY CONSTRUCTION QUALITY CONTROL REPORT

Date: _____ Report No. _____

Contract
No.:_____

Description and Location of work:
_____

_____

WEATHER: (Clear) (P. Cloudy) (Cloudy);
Temperature:_____ Min. _____ Max;
Rainfall _____ inches.

Contractor/Subcontractors and Area of Responsibility with Labor Count for Each
a._____

b._____

c._____

d._____

Equipment Data: (Indicate items of construction equipment, other than hand tools, at the job site, and whether or not used.)
_____
_____

1. Work Performed Today: (Indicate location and description of work performed. Refer to work performed by prime and/or subcontractors by letter in Table above. If no work is performed, report the reason.)
_____
_____

2. Results of Surveillance: (Include satisfactory work completed, or deficiencies with action to be taken.)

a. Preparatory Inspection:

_____

b. Initial Inspection:

_____

c. Follow-up Inspections:

_____

3. Test Required by Plans and/or Specifications performed and Results of Tests:

_____

_____

4. Verbal Instructions Received: (List any instructions given by Government personnel on construction deficiencies, retesting required, etc., with action to be taken.)

_____

_____

_____

_____

5. Remarks: (Cover any conflicts in plans, specifications, or instructions or any delay to the job.)

_____

_____

_____

_____

6. Results of Safety Inspection: (Include safety violations and corrective actions taken.)

_____

_____

_____

_____

_____
Contractor's Inspector

CONTRACTOR'S VERIFICATION: The above report is complete and correct and all material and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications except as noted above.

_____
Contractor's Chief of Quality Control

NOTE:
DO NOT LEAVE REPORT ITEMS BLANK

Items 1. through 6. must be reported every day. If there is no other report on an item, enter the work "none" in the reporting space. Reports with items left blank will be returned as incomplete.

PREPARATORY PHASE CHECKLIST

Contract No._____ Date:_____

Definable Feature:_____ Spec Section:_____

Gov't Rep Notified _____ Hours in Advance Yes_____ No_____

I. Personnel Present:

	Name	Position	Company/Government
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

(List additional personnel on reverse side)

PPC Page 1

II. Submittals

1. Review submittals and/or submittal log 4288.
Have all submittals been approved? Yes_____ No_____

If no, what items have not been submitted?

a._____
_____
b._____
_____
c._____
_____

2. Are all materials on hand? Yes_____ No_____

If no, what items are missing?

a._____
_____
b._____
_____
c._____
_____

3. Check approved submittals against delivered materials. (This should be done as material arrives.)

Comments_____
_____
_____
_____
_____
_____
_____

III. Material storage

Are materials stored properly? Yes_____ No _____

If No, what action is taken?_____
_____
_____
_____

IV. Specifications

1. Review each paragraph of specifications.

2. Discuss procedure for accomplishing the work.

3. Clarify any differences.

V. Preliminary Work and Permits

Ensure preliminary work is correct and permits are on file.
If not, what action is taken? _____

VI. Testing

1. Identify test to be performed, frequency, and by whom.

2. When required?

3. Where required?

4. Reviewing Testing Plan.

5. Have test facilities been approved?

VII. Safety

1. Review applicable portion of EM 385-1-1.

_____

_____

2. Activity Hazard Analysis approved? Yes _____ No _____

VIII. Corps of Engineers comments during meeting.

_____

_____

_____

_____

_____

_____

_____

_____

_____
CQC REP

PPC Page 4

INITIAL PHASE CHECKLIST

Contract No._____ Date:_____

Definable Feature:_____

Gov't Rep Notified _____ Hours in Advance Yes_____ No_____

I. Personnel Present:

	Name	Position	Company/Government
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

(List additional personnel on reverse side)

IC Page 1

II.
Identify full compliance with procedures identified at preparatory. Coordinate plans, specifications, and submittals.

Comments
_____
_____
_____
_____
_____
_____
_____

III. Preliminary Work. Ensure preliminary work is complete and correct. If not, what action is taken?
_____
_____
_____
_____
_____
_____
_____

IV. Establish Level of Workmanship.

1. Where is work located?_____
_____

2. Is a sample panel required? Yes _____ No _____

3. Will the initial work be considered as a sample?

Yes _____ No _____

(If yes, maintain in present condition as long as possible.)

V. Resolve any differences.

Comments
_____
_____
_____
_____
_____
_____
_____

VI. Check Safety

Review job conditions using EM 385-1-1 and job hazard analysis.

Comments_____

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CQC REP

IC Page 3

-- End of Section --

SECTION 01722

MOBILIZATION AND DEMOBILIZATION
02/2001

PART 1 GENERAL

1.1 MOBILIZATION

Mobilization will be considered the transportation to the project site of all plant and equipment for the various items of work such as airfield paving work. It includes erection of the asphalt batch plant. Payments in accordance with paragraph MEASUREMENT AND PAYMENT and the Bidding Schedule's Bid Item will be made upon completion of the mobilization as described above and in accordance with Contract Clause PROGRESS PAYMENTS. Purchase of plant and equipment will not be considered as mobilization cost.

1.2 DEMOBILIZATION

Demobilization will be considered the transportation of all plant and equipment from the project site, and the disassembly of the asphalt batch plant. Payment for demobilization will be included in the payment after the plant and equipment are removed from the project site under this Contract, in accordance with the CONTRACT CLAUSES and Section 01000 CONSTRUCTION SCHEUDULE.

1.3 MEASUREMENT AND PAYMENT

(a) All costs connected with the mobilization and demobilization of all of the Contractor's plant and equipment will be paid for at the contract lump sum price for this Item. **(AM#1)** _____.

(b) In the event the Contracting Officer considers that the amount in this Item **(AM#1)** _____ does not bear a reasonable relation to the cost of the work in this Contract, the Contracting Officer may require the Contractor to produce cost data to justify this portion of the bid. Failure to justify such price to the satisfaction of the Contracting Officer will result in payment of actual mobilization costs, as determined by the Contracting Officer at the completion of mobilization, and actual demobilization costs, as determined by the Contracting Officer at the completion of demobilization, and payment of the remainder of this Item in the final payment under this Contract. The determination of the Contracting Officer is not subject to appeal.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section --

SECTION 02754

CONCRETE PAVEMENTS FOR SMALL PROJECTS
[AM #1]

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ACI INTERNATIONAL (ACI)

ACI 211.1	(1991) Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
ACI 301	(1996) Standard Specification for Structural Concrete
ACI 305R	(1991) Hot Weather Concreting

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 184/A 184M	(1996) Fabricated Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A 185	(1997) Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
ASTM A 497	(1997) Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement
ASTM A 615/A 615M	(1996a) Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM C 31/C 31M	(1996) Making and Curing Concrete Test Specimens in the Field
ASTM C 33	(1997) Concrete Aggregates
ASTM C 39	(1996) Compressive Strength of Cylindrical Concrete Specimens
ASTM C 94	(1998) Ready-Mixed Concrete
ASTM C 117	(1995) Materials Finer Than 75 micrometer (No. 200) Sieve in Mineral Aggregates by Washing

ASTM C 123	(1996) Lightweight Pieces in Aggregate
ASTM C 131	(1996) Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 142	(1978; R 1997) Clay Lumps and Friable Particles in Aggregates
ASTM C 143	(1990a) Slump of Hydraulic Cement Concrete
ASTM C 150	(1997) Portland Cement
ASTM C 192/C 192M	(1995) Making and Curing Concrete Test Specimens in the Laboratory
ASTM C 231	(1997) Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	(1995) Air-Entraining Admixtures for Concrete
ASTM C 295	(1998) Petrographic Examination of Aggregates for Concrete
ASTM C 494	(1992) Chemical Admixtures for Concrete
ASTM C 618	(1997) Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 666	(1992) Resistance of Concrete to Rapid Freezing and Thawing
ASTM C 881	(1990) Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C 1077	(1997) Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM D 1752	(1984; R 1996) Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

ARMY CORPS OF ENGINEERS (COE)

COE CRD-C 130	(1989) Scratch Hardness of Coarse Aggregate Particles
COE CRD-C 300	(1990) Specifications for Membrane-Forming

Compounds for Curing Concrete

NATIONAL READY-MIXED CONCRETE ASSOCIATION (NRMCA)

NRMCA CPMB 100 (1996) Concrete Plant Standards

1.2 SYSTEM DESCRIPTION

This section is intended to stand alone for construction of concrete (rigid) pavement. However, where the construction covered herein interfaces with other sections, the construction at each interface shall conform to the requirements of both this section and the other section, including tolerances for both.

1.3 ACCEPTABILITY OF WORK

The pavement will be accepted on the basis of tests made by the Government and by the Contractor or its suppliers, as specified herein. The Government may, at its discretion, make check tests to validate the results of the Contractor's testing. Concrete samples shall be taken by the Contractor at the placement to determine the slump, air content, and strength of the concrete. Test cylinders shall be made for determining conformance with the strength requirements of these specifications and, when required, for determining the time at which pavements may be placed into service. All air content measurements shall be determined in accordance with ASTM C 231. All slump tests shall be made in accordance with ASTM C 143. All test cylinders shall be 6 by 12 inch cylinders and shall be fabricated in accordance with ASTM C 192/C 192M, using only steel molds, cured in accordance with ASTM C 31/C 31M, and tested in accordance with ASTM C 39. A strength test shall be the average of the strengths of two cylinders made from the same sample of concrete and tested at 28 days. The Contractor shall furnish all materials, labor, and facilities required for molding, curing, testing, and protecting test specimens at the site and in the laboratory.

1.3.1 Evaluation Sampling

Sampling, testing, and mixture proportioning shall be performed by a commercial Testing Laboratory, conforming with ASTM C 1077. The individuals who sample and test concrete and concrete constituents shall be certified as American Concrete Institute (ACI) Concrete Field Testing Technicians, Grade I. The individuals who perform the inspection of concrete shall be certified as ACI Concrete Construction Inspector, Level II. All mix design, weekly quality control reports, smoothness reports, and project certification reports shall be signed by a Registered Engineer.

1.3.2 Surface Testing

Surface testing for surface smoothness and plan grade shall be performed as indicated below by the Testing Laboratory. The measurements shall be properly referenced in accordance with paving lane identification and stationing, and a report given to the Government within 24 hours after measurement is made. A final report of surface testing, signed by a Registered Engineer, containing all surface measurements and a description

of all actions taken to correct deficiencies, shall be provided to the Government upon conclusion of surface testing.

1.3.2.1 Surface Smoothness Requirements

The finished surfaces of the pavements shall have no abrupt change of 1/8 inch or more, and all pavements shall be within the tolerances specified in Table 1 when checked with the straightedge.

TABLE 1
STRAIGHTEDGE SURFACE SMOOTHNESS--PAVEMENTS

Pavement Category	Direction of Testing	Tolerances inches
All Airfield Paved Areas	Longitudinal	1/4
	Transverse	1/4

1.3.2.2 Surface Smoothness Testing Method

The surface of the pavement shall be tested with the straightedge to identify all surface irregularities exceeding the tolerances specified above. The entire area of the pavement shall be tested in both a longitudinal and a transverse direction on parallel lines approximately 15 feet apart. The straightedge shall be held in contact with the surface and moved ahead one-half the length of the straightedge for each successive measurement. The amount of surface irregularity shall be determined by placing the straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length and measuring the maximum gap between the straightedge and the pavement surface, in the area between these two high points.

1.3.3 Plan Grade Testing and Conformance

The finished surface of the pavements shall conform, within the tolerances shown in Table 1, to the lines, grades, and cross sections shown. The finished surface of new abutting pavements shall coincide at their juncture. The finished surface of airfield pavements shall vary not more than 0.04 foot above or below the plan grade line or elevation indicated. The surfaces of other pavements shall vary not more than 0.06 foot above or below the plan grade line or elevation indicated. Each pavement category shall be checked by the Contractor for conformance with plan grade requirements by running lines of levels at intervals to determine the elevation at each joint intersection.

1.4 PRECONSTRUCTION TESTING OF MATERIALS

The Contractor shall not be entitled to any additional payment or extension of time because of delays caused by sampling and testing additional

sources, or samples, necessitated by failure of any samples. Aggregates shall be sampled and tested by the Test Laboratory and shall be representative of the materials to be used for the project. Test results, signed by a Registered Engineer, shall be submitted 90 days before commencing paving. No aggregate shall be used unless test results show that it meets all requirements of these specifications, including compliance with ASTM C 33 and deleterious materials limitations.

1.5 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment; G

Manufacturer's literature on the concrete plant; mixing equipment; hauling equipment; placing and finishing, and curing equipment; at least 7 days prior to start of paving.

SD-07 Certificates

Mixture Proportions; G

The report of the Contractor's mixture proportioning studies showing the proportions of all ingredients and supporting information on aggregate and other materials that will be used in the manufacture of concrete, at least 14 days prior to commencing concrete placing operations.

Paving; G

Paving Schedules at least 7 days prior to start of paving.

1.6 EQUIPMENT

1.6.1 Batching and Mixing

The batching plant shall conform to NRMCA CPMB 100, the equipment requirements in ASTM C 94, and as specified. Water shall not be weighed or measured cumulatively with another ingredient. All concrete materials batching shall meet ASTM C 94 requirements. Mixers shall be stationary mixers or truck mixers. Batching, mixers, mixing time, permitted reduction of mixing time, and concrete uniformity shall meet the requirements of ASTM C 94, and shall be documented in the initial weekly QC Report.

1.6.2 Transporting Equipment

Transporting equipment shall be in conformance with ASTM C 94 and as specified herein. Concrete shall be transported to the paving site in rear-dump trucks, in truck mixers designed with extra large blading and rear opening specifically for low slump concrete, or in agitators.

Bottom-dump trucks shall not be used for delivery of concrete.

1.6.3 Delivery Equipment

When concrete transport equipment cannot operate on the paving lane, side-delivery transport equipment consisting of self-propelled moving conveyors shall be used to deliver concrete from the transport equipment and discharge it in front of the paver. Front-end loaders, dozers, or similar equipment shall not be used to distribute the concrete.

1.6.4 Paver-Finisher

The paver-finisher shall be a heavy-duty, self-propelled machine designed specifically for paving and finishing high quality pavement. The contractor may use either a paver-finisher designed for fixed form paving or a paver-finisher designed for slipform paving. The paver-finisher shall weigh at least 2200 lb./foot of lane width, and shall be powered by an engine having at least 6.0 horsepower per foot of lane width. The paver-finisher shall spread, consolidate, and shape the plastic concrete to the desired cross section in one pass. The paver-finisher shall be equipped with a full width "knock-down" auger, capable of operating in both directions, which will evenly spread the fresh concrete in front of the screed or extrusion plate. Immersion vibrators shall be gang mounted at the front of the paver on a frame equipped with suitable controls so that all vibrators can be operated at any desired depth within the slab or completely withdrawn from the concrete. The vibrators shall be automatically controlled so that they will be immediately stopped as forward motion of the paver ceases. The spacing of the immersion vibrators across the paving lane shall be as necessary to properly consolidate the concrete, but the clear distance between vibrators shall not exceed 30 inches, and the outside vibrators shall not exceed 12 inches from the edge of the lane. The paver-finisher shall be equipped with a transversely oscillating screed or an extrusion plate to shape, compact, and smooth the surface.

1.6.4.1 Other Types of Finishing Equipment

Bridge deck finishers shall not be used. Clary screeds or other rotating tube floats will not be allowed on the project.

1.6.5 Curing Equipment

Equipment for curing is specified in paragraph CURING.

1.6.6 Texturing Equipment

Texturing equipment shall be as specified below.

1.6.6.1 Fabric Drag

A fabric drag shall consist of a piece of fabric material as wide as the lane width securely attached to a separate wheel mounted frame spanning the paving lane or to one of the other similar pieces of equipment. The material shall be wide enough to provide 12 to 18 inches dragging flat on

the pavement surface. The fabric material shall be clean, reasonably new burlap, kept clean and saturated during use.

1.6.7 Sawing Equipment

Equipment for sawing joints and for other similar sawing of concrete shall be standard diamond-tip-bladed concrete saws mounted on a wheeled chassis.

1.6.8 Straightedge

The Contractor shall furnish and maintain at the job site one 12 foot straightedge for testing concrete surface smoothness. The straightedge shall be constructed of aluminum or magnesium alloy and shall have blades of box or box-girder cross section with flat bottom, adequately reinforced to insure rigidity and accuracy. Straightedges shall have handles for operation on the pavement.

PART 2 PRODUCTS

2.1 CEMENTITIOUS MATERIALS

Cementitious materials shall be portland cement or portland cement in combination with pozzolan and shall conform to appropriate specifications listed below.

2.1.1 Portland Cement

Portland cement shall conform to ASTM C 150 Type I ,II, or III low-alkali including false set requirements.

2.1.2 Pozzolan (Fly Ash)

Fly ash shall conform to ASTM C 618 Class C or F, including all the supplementary optional physical requirements.

2.2 AGGREGATES

Aggregates shall consist of clean, hard, uncoated particles meeting the requirements of ASTM C 33, including other requirements specified herein. Aggregate not having a satisfactory demonstrable service record of at least 5 years successful service in three paving projects shall have a durability factor of 50 or more when subjected to freezing and thawing in concrete in accordance with ASTM C 666.

In addition to the grading requirements specified for coarse aggregate and for fine aggregate, the combined aggregate grading shall meet the following requirements.

a. If necessary, a blending aggregate shall be used to meet the required combined grading. This blending aggregate shall be batched separately. The combined grading of all aggregates used, in the proportions selected, shall be computed on the basis of cumulative percent retained on each sieve specified for fine and coarse aggregate.

b. The materials selected and the proportions used shall be such that when the Coarseness Factor (CF) and the Workability Factor (W) are plotted on a diagram as described in d. below, the point thus determined shall fall within the parallelogram described therein.

c. The Coarseness Factor (CF) shall be determined from the the following equation:

CF = (cumulative percent retained on the 3/8 in. sieve)(100)/(cumulative percent retained on the No. 8 sieve)

The Workability Factor (W) is defined as the cumulative percent passing the No. 8 sieve. However, W shall be adjusted, upwards only, by 2.5 percentage points for each 94 pounds of cementitious material per cubic yard greater than 564 pounds per cubic yard.

d. A diagram shall be plotted using a rectangular scale with W on the Y-axis with units from 20 (bottom) to 45 (top), and with CF on the X-axis with units from 80 (left side) to 30 (right side). On this diagram a parallelogram shall be plotted with corners at the following coordinates (CF-75, W-28), (CF-75, W-40), (CF-45, W-32.5), and (CF-45, W-41). If the point determined by the intersection of the computed CF and W does not fall within the above parallelogram, the grading of each size of aggregate used and the proportions selected shall be changed as necessary.

e. In addition, the individual percent retained on each sieve shall be plotted for the combined aggregate grading, on either rectangular or semi-log graph paper. The graph shall show a relative smooth transition between coarse and fine aggregate and shall have no major valleys or peaks in the area smaller than the No. 8 sieve. If this plot does not meet the above criteria, the grading of each size aggregate used and the proportions selected shall be changed as necessary.

2.2.1 Coarse Aggregate

Coarse aggregate shall consist of crushed stone. The nominal maximum size of the coarse aggregate shall be 3/4 inches. Coarse aggregate shall not show more than 40 percent loss when subjected to the Los Angeles abrasion test in accordance with ASTM C 131. The amount of deleterious material in coarse aggregate shall not exceed the limits shown in Table 5 below, determined in accordance with the test methods shown.

TABLE 5
LIMITS OF DELETERIOUS MATERIALS IN COARSE AGGREGATE
FOR AIRFIELD PAVEMENTS
Percentage by Mass

Materials	
Clay lumps and friable particles (ASTM C 142)	0.2
Shale (a) (ASTM C 295)	0.2
Material finer than 0.075 mm (No. 200 sieve) (b) (ASTM C 117)	0.5
Lightweight particles (c) (ASTM C 123)	0.2
Clay ironstone (d) (ASTM C 295)	0.5
Chert and cherty stone (less than 2.40 Mg/cubic meter density SSD (2.40 Sp. Gr.)) (e) (ASTM C 295)	0.5
Claystone, mudstone, and siltstone (f) (ASTM C 295)	0.1
Shaly and argillaceous limestone (g) (ASTM C 295)	0.2
Other soft particles COE CRD-C 130	1.0
Total of all deleterious substances exclusive of material finer than 0.075 mm (No. 200 sieve)	2.0

a. Shale is defined as a fine-grained, thinly laminated or fissile sedimentary rock. It is commonly composed of clay or silt or both. It has been indurated by compaction or by cementation, but not so much as to have become slate.

b. Limit for material finer than 0.075 mm (No. 200 sieve) will be increased to 1.5 percent for crushed aggregates if the fine material consists of crusher dust that is essentially free from clay or shale.

c. The separation medium shall have a density of 2.0 Mg/cubic meter (Sp. Gr. of 2.0).

d. Clay ironstone is defined as an impure variety of iron carbonate,

iron oxide, hydrous iron oxide, or combinations thereof, commonly mixed with clay, silt, or sand. It commonly occurs as dull, earthy particles, homogeneous concretionary masses, or hard-shell particles with soft interiors. Other names commonly used for clay ironstone are "chocolate bars" and limonite concretions.

e. Chert is defined as a rock composed of quartz, chalcedony or opal, or any mixture of these forms of silica. It is variable in color. The texture is so fine that the individual mineral grains are too small to be distinguished by the unaided eye. Its hardness is such that it scratches glass but is not scratched by a knife blade. It may contain impurities such as clay, carbonates, iron oxides, and other minerals. Other names commonly applied to varieties of chert are: flint, jasper, agate, onyx, hornstone, porcellanite, novaculite, sard, carnelian, plasma, bloodstone, touchstone, chrysoprase, heliotrope, and petrified wood. Cherty stone is defined as any type of rock (generally limestone) that contains chert as lenses and nodules, or irregular masses partially or completely replacing the original stone.

f. Claystone, mudstone, or siltstone, is defined as a massive fine-grained sedimentary rock that consists predominantly of indurated clay or silt without laminations or fissility. It may be indurated either by compaction or by cementation.

g. Shaly limestone is defined as limestone in which shale occurs as one or more thin beds or laminae. These laminae may be regular or very irregular and may be spaced from a few inches down to minute fractions of an inch. Argillaceous limestone is defined as a limestone in which clay minerals occur disseminated in the stone in the amount of 10 to 50 percent by weight of the rock; when these make up from 50 to 90 percent, the rock is known as calcareous (or dolomitic) shale (or claystone, mudstone, or siltstone).

Testing Sequence Deleterious Materials

The size of the sample shall be at least 200 pounds for the 3/4 to 1-1/2 inch size and 25 pounds for the No. 4 to 3/4 inch coarse aggregate and 10 pounds for the fine aggregate. The Contractor shall provide facilities for the ready procurement of representative test samples. Samples shall be taken and tested by and at the expense of the Contractor, using appropriate Corps of Engineers laboratory and ASTM test methods. Additional tests and analyses of aggregates at various stages in the processing and handling operations may be made by the Government at the discretion of the Contracting Officer. Such Government testing will not relieve the Contractor of any of its testing responsibilities. The testing procedure on each sample of coarse aggregate for compliance with limits on deleterious materials shall be as follows:

Step 1: Test approximately one-fifth of sample for material finer than the No. 200 sieve.

Step 2: Wash off material finer than No. 200 sieve from the remainder of

the sample and recombine the remainder with material retained on the No. 200 sieve from Step 1.

Step 3: Test remaining full sample for clay lumps and friable particles and remove.

Step 4: Test remaining full sample for lightweight particles and remove, and then for chert and/or cherty stone with SSD density of less than 2.40 Mg/cubic meter (Sp. Gr. 2.40) and remove.

Step 5: Test remaining sample for clay-ironstone, shale, claystone, mudstone, siltstone, shaly and/or argillaceous limestone, and remove.

Step 6: Test approximately one-fifth of remaining full sample for other soft particles.

Determination of deleterious materials listed in Steps 4 and 5 shall be performed by an individual specifically trained in petrographic identification. The individual selected to perform the identification of these deleterious materials shall be subject to approval and, at least 10 days before any individual is proposed to commence this type of work, the Contractor shall submit a written resume of the individual's training and experience for approval by the U.S. Army Corps of Engineers, Omaha District, CENWO-ED-GA (David P. Ray). The Contractor will not be entitled to any extension of time or additional payment due to any delays caused by the testing, evaluation, or personnel requirements.

2.2.2 Alkali-Silica Reactivity for Coarse Aggregate

The coarse aggregate shall be tested in conformance to ASTM C 1260. Expansion shall not be greater then 0.10 after 16 days. In lieu of using the standard materials and proportioning, the contractor's proposed materials and concrete proportioning shall be used in the testing.

2.2.3 Fine Aggregate

Fine aggregate shall consist of natural sand, manufactured sand, or a combination of the two, and shall be composed of clean, hard, durable particles. All fine aggregate shall be composed of clean, hard, durable particles meeting the requirements of ASTM C 33 and the requirements herein. The amount of deleterious material in the fine aggregate shall not exceed the limits in ASTM C 33and shall not exceed the following limits:

a. Lightweight particles (ASTM C 123) 1.0 percent max. by mass using a medium with a density of Sp. Gr. of 2.0.

b. The total of all deleterious material types, listed in ASTM C 33 and above, shall not exceed 3.0 percent of the mass of the fine aggregate.

2.2.4 Alkali-Silica Reactivity for Fine Aggregate

The fine aggregate shall be tested in conformance to ASTM C 1260. Expansion shall not be greater then 0.10 after 16 days. In lieu of using

the standard materials and proportioning, the contractor's proposed materials and concrete proportioning shall be used in the testing.

2.3 CHEMICAL ADMIXTURES

Air-entraining admixture shall conform to ASTM C 260. An accelerator shall be used only when specified in paragraph SPECIFIED CONCRETE STRENGTH AND OTHER PROPERTIES and shall not be used to reduce the amount of cementitious material used. Accelerator shall conform to ASTM C 494Type C. Calcium chloride and admixtures containing calcium chloride shall not be used. A water-reducing or retarding admixture shall meet the requirements of ASTM C 494. Type G or H admixtures are not allowed.

2.4 CURING MATERIALS

Membrane forming curing compound shall be a white pigmented compound conforming to COE CRD-C 300. Burlap shall be new or shall be clean material never used for anything other than curing concrete.

2.5 WATER

Water for mixing and curing shall be clean, potable, and free of injurious amounts of oil, acid, salt, or alkali.

2.6 JOINT MATERIALS

2.6.1 Expansion Joint Material

Expansion joint filler shall be a preformed material conforming to ASTM D 1752 Type I or II. Expansion joint filler shall be 3/4 inch thick as shown on the drawings.

2.7 REINFORCING

2.7.1 General

Reinforcing bars shall conform to ASTM A 615/A 615M Grade 40 or 60. Bar mats shall conform to ASTM A 184/A 184M. The bar members shall be billet steel. Welded steel wire fabric shall conform to ASTM A 185. Deformed steel wire fabric shall conform to ASTM A 497. Reinforcement shall be free from loose, flaky rust, loose scale, oil, grease, mud, or other coatings that might reduce the bond with concrete.

2.8 DOWELS

2.8.1 Dowels

Dowels shall be single piece, plain (non-deformed) steel bars conforming to ASTM A 615/A 615M Grade 60 or higher. Dowels shall be free of loose, flaky rust and loose scale and shall be clean and straight. At least one half of the smooth dowel shall be epoxy-coated and shall conform to ASTM A 775.

2.9 EPOXY RESIN

All epoxy-resin materials shall be two-component materials conforming to ASTM C 881, Class as appropriate for each application temperature to be encountered; except, that in addition, the materials shall meet the following requirements:

a. Material for use for embedding dowels and anchor bolts shall be Type IV, Grade 3.

b. Material for use as patching for complete filling of spalls, wide cracks, and other voids and for use in preparing epoxy resin mortar shall be Type III, Grade as approved.

c. Material for injecting cracks shall be Type IV, Grade 1.

d. Material for bonding freshly mixed portland cement concrete, mortar, or freshly mixed epoxy resin concrete to hardened concrete shall be Type V, Grade as approved.

2.10 SPECIFIED CONCRETE STRENGTH AND OTHER PROPERTIES

Specified compressive strength, f'c, for concrete is 6000 psi at 28 days. Maximum allowable water-cementitious material ratio is 0.45. The water-cementitious material ratio is based on absolute volume equivalency, where the ratio is determined using the weight of cement for a cement only mix, or using the total volume of cement plus pozzolan converted to an equivalent weight of cement by the absolute volume equivalency method described in ACI 211.1. The concrete shall be air-entrained with a total air content of 5 plus or minus 1 percent. The maximum allowable slump of the concrete shall be 3 inchesfor pavement constructed with fixed forms. The strength of the concrete will be considered satisfactory so long as the average of all sets of three consecutive test results equals or exceeds the specified compressive strength f'c and no individual test result falls below the specified strength f'c by more than 500 psi. Additional analysis or testing, including taking cores and/or load tests may be required at the Contractor's expense when the strength of the concrete in the structure is considered potentially deficient.

2.11 MIXTURE PROPORTIONS

2.11.1 Composition Concrete

Composition concrete shall be composed of cementitious material, water, fine and coarse aggregates, and admixtures. Fly ash, if used, shall be used only at a rate between 15 and 35 percent by mass of the total cementitious material. Admixtures shall consist of air entraining admixture and may also include, as approved accelerator retarder or water-reducing admixture. High range water-reducing admixtures and admixtures to produce flowable concrete shall not be used. No substitutions shall be made in the materials used in the mixture proportions without additional tests to show that the quality of the concrete is satisfactory.

2.11.2 Concrete Mixture Proportioning Studies

Trial design batches, mixture proportioning studies, and testing shall be the responsibility of the Contractor, and shall be performed by the Test Laboratory and signed by a Registered Engineer. No concrete pavement shall be placed until the Contracting Officer has approved the Contractor's mixture proportions. All materials used in mixture proportioning studies shall be representative of those proposed for use on the project. If there is a change in materials, additional mixture design studies shall be made using the new materials. Trial mixtures having proportions, slumps, and air content suitable for the work shall be based on methodology described in ACI 211.1. At least three different water-cementitious ratios, which will produce a range of strength encompassing that required on the project, shall be used. Laboratory trial mixtures shall be proportioned for maximum permitted slump and air content. Maximum sand content shall be 40 percent of the total aggregate SSD weight. Aggregate quantities shall be based on the mass in a saturated surface dry condition.

2.11.3 Mixture Proportioning Procedure

The Contractor shall perform the following:

a. Fabricate, cure and test 6 test cylinders per age for each mixture at 7 and 28 days.

b. Using the average strength for each w/(c+p), plot the results from each of the three mixtures on separate graphs for w/(c+p) versus 28-day strength.

c. From the graphs select a w/(c+p) which will produce a mixture giving a 28-day strength equal to the required strength determined in accordance with the following paragraph.

2.11.4 Average Strength Required for Mixtures

In order to ensure meeting, during production, the strength requirements specified, the mixture proportions selected shall produce a required average strength, f'cr, exceeding the specified strength, f'c, in accordance with procedures in Chapter 3 of ACI 301, "Proportioning."

PART 3 EXECUTION

3.1 CONDITIONING OF UNDERLYING MATERIAL

Underlying material, base course, upon which concrete is to be placed shall be clean, damp, and free from debris, waste concrete or cement, frost, ice, and standing or running water. After the underlying material has been prepared for concrete placement, no equipment shall be permitted thereon.

3.2 WEATHER LIMITATIONS

3.2.1 Hot Weather Paving

The temperature of concrete shall not exceed 90 degrees F. Steel forms, dowels and reinforcing shall be cooled prior to concrete placement when steel temperatures are greater than 120 degrees F.

3.3 CONCRETE PRODUCTION

3.3.1 General Requirements

Concrete shall be deposited in front of the paver within 45 minutes from the time cement has been charged into the mixing drum, except that if the ambient temperature is above 90 degrees F, the time shall be reduced to 30 minutes. Every load of concrete delivered to the paving site shall be accompanied by a batch ticket from the operator of the batching plant. Tickets shall show at least the mass, or volume, of all ingredients in each batch delivered, the water meter and revolution meter reading on truck mixers and the time of day. Tickets shall be delivered to the placing foreman who shall keep them on file and deliver them to the Government daily.

3.3.2 Transporting and Transfer-Spreading Operations

Non-agitating equipment shall be used only on smooth roads and for haul time less than 15 minutes. No equipment shall be allowed to operate on the prepared and compacted underlying material in front of the paver-finisher. Additional water may be added to truck mixers to bring the slump within the specified range provided the mixture water-cement ratio is not exceeded.

3.4 PAVING

Pavement shall be constructed with paving and finishing equipment utilizing fixed forms.

3.4.1 Consolidation

The paver vibrators shall be inserted into the concrete not closer to the underlying material than 2 inches. The vibrators or any tamping units in front of the paver shall be automatically controlled so that they shall be stopped immediately as forward motion ceases. Excessive vibration shall not be permitted. Concrete in small, odd-shaped slabs or in locations inaccessible to the paver mounted vibration equipment shall be vibrated with a hand-operated immersion vibrator. Vibrators shall not be used to transport or spread the concrete.

3.4.2 Operation

When the paver is operated between or adjacent to previously constructed pavement (fill-in lanes), provisions shall be made to prevent damage to the previously constructed pavement, including keeping the existing pavement surface free of any debris, and placing rubber mats beneath the paver tracks. Transversely oscillating screeds and extrusion plates shall overlap the existing pavement the minimum possible, but in no case more than 8 inches.

3.4.3 Required Results

[AM #1]
The contractor may use a paver-finisher designed for fixed form paving .

The paver-finisher shall be operated to produce a thoroughly consolidated slab throughout, true to line and grade within specified tolerances. The paver-finishing operation shall produce a surface finish free of irregularities, tears, voids of any kind, and any other discontinuities. It shall produce only a very minimum of paste at the surface. Multiple passes of the paver-finisher shall not be permitted. The equipment and its operation shall produce a finished surface requiring no hand finishing, other than the use of cutting straightedges, except in very infrequent instances. No water, other than true fog sprays (mist), shall be applied to the concrete surface during paving and finishing.

3.4.4 Fixed Form Paving

Forms used to place individual slabs shall be steel, except that wood forms may be used for curves having a radius of 150 feet or less, and for fillets. Forms may be built up with metal or wood, added only to the base, to provide an increase in depth of not more than 25 percent. The base width of the form shall be not less than eight-tenths of the vertical height of the form, except that forms 8 inches or less in vertical height shall have a base width not less than the vertical height of the form. Forms shall be set on firm material cut true to grade so that each form section when placed will be firmly in contact with the underlying layer for its entire base. Forms shall not be set on blocks or on built-up spots of underlying material. Forms shall remain in place at least 12 hours after the concrete has been placed. Forms shall be removed without injuring the concrete.

3.4.5 Placing Reinforcing Steel

Reinforcement shall be positioned on suitable chairs securely fastened to the subgrade prior to concrete placement, or may be placed on an initial layer of consolidated concrete, with the subsequent layer placed within 30 minutes of the first layer placement.

3.4.6 Placing Dowels

The method used in installing and holding dowels in position shall ensure that the error in alignment of any dowel from its required alignment after the pavement has been complete will not be greater than 1/8 inch per foot. Except as otherwise specified below, location of dowels shall be within a horizontal tolerance of plus or minus 5/8 inch and a vertical tolerance of plus or minus 3/16 inch. The portion of each dowel intended to move within the concrete or expansion cap shall be painted with one coat of rust inhibiting primer paint, and then oiled just prior to placement. Dowels in joints shall be omitted when the center of the dowel is located within a horizontal distance from an intersecting joint equal to or less than one-fourth of the slab thickness.

3.4.6.1 Construction Joints-Fixed Form Paving

Installation of dowels shall be by the bonded-in-place method, supported by means of devices fastened to the forms. Installation by removing and replacing in preformed holes will not be permitted.

3.4.6.2 Dowels Installed in Hardened Concrete

Installation shall be by bonding the dowels into holes drilled into the hardened concrete. Holes approximately 1/8 inch greater in diameter than the dowels shall be drilled into the hardened concrete. Dowels shall be bonded in the drilled holes using epoxy resin injected at the back of the hole before installing the dowel and extruded to the collar during insertion of the dowel so as to completely fill the void around the dowel. Application by buttering the dowel shall not be permitted. The dowels shall be held in alignment at the collar of the hole, after insertion and before the grout hardens, by means of a suitable metal or plastic collar fitted around the dowel. The vertical alignment of the dowels shall be checked by placing the straightedge on the surface of the pavement over the top of the dowel and measuring the vertical distance between the straightedge and the beginning and ending point of the exposed part of the dowel.

3.5 FINISHING

Clary screeds, "bridge deck" finishers, or other rotating pipe or tube type equipment shall not be permitted. The sequence of machine operations shall be transverse finishing, longitudinal machine floating if used, straightedge finishing, texturing, and then edging of joints. Hand finishing shall be used only infrequently and only on isolated areas of odd slab shapes and in the event of a breakdown of the mechanical finishing equipment. Supplemental hand finishing for machine finished pavement shall be kept to an absolute minimum. Equipment to be used for supplemental hand finishing shall primarily be 10 to 12 feet cutting straightedges; only very sparing use of bull floats shall be allowed. At no time shall water be added to the surface of the slab in any way, except for fog (mist) sprays to prevent plastic shrinkage cracking.

3.5.1 Machine Finishing

The machine shall make only one pass over each area of pavement. If the equipment and procedures do not produce a surface of uniform texture, true to grade, in one pass, the operation shall be immediately stopped and the equipment, mixture, and procedures adjusted as necessary.

3.5.2 Surface Correction

While the concrete is still plastic, irregularities and marks in the pavement surface shall be eliminated by means of cutting straightedges, 10 to 12 feet in length. Depressions shall be filled with freshly mixed concrete, struck off, consolidated, and refinished. Projections above the required elevation shall also be struck off and refinished. Long-handled, flat "bull floats" shall be used sparingly and only as necessary to correct minor, scattered surface defects. Finishing with hand floats and trowels shall be held to the absolute minimum necessary. Joints and edges shall not be overfinished.

3.5.3 Hand Finishing

Hand finishing operations shall be used only for those unusual slabs as

specified previously. Grate tampers (jitterbugs) shall not be used. As soon as placed and vibrated, the concrete shall be struck off and screeded. The surface shall be tamped with a strike-off and tamping screed, or vibratory screed. Immediately following the final tamping of the surface, the pavement shall be floated longitudinally. Long-handled, flat bull floats shall be used sparingly and only as necessary to correct surface defects. Finishing with hand floats and trowels shall be held to the absolute minimum necessary. Joints and edges shall not be overfinished. No water shall be added to the pavement during finishing operations.

3.5.4 Texturing

Before the surface sheen has disappeared and before the concrete hardens, the surface of the pavement shall be given a texture as described herein. Following initial texturing on the first day of placement, the Placing Foreman, Contracting Officer representative, and a representative of the Using Agency shall inspect the texturing for compliance with design requirements. After curing is complete, all textured surfaces shall be thoroughly power broomed to remove all debris. The concrete in areas of recesses for tie-down anchors, lighting fixtures, and other outlets in the pavement shall be finished to provide a surface of the same texture as the surrounding area.

3.5.4.1 Fabric-Drag Surface Finish

Surface texture shall be applied by dragging the surface of the pavement, in the direction of the concrete placement, with a moist fabric drag. The dragging shall produce a uniform finished surface having a fine sandy texture without disfiguring marks.

3.5.5 Edging

After texturing has been completed, the edge of the slabs along the forms shall be carefully finished with an edging tool to form a smooth rounded surface of 1/8 inch radius. No water shall be added to the surface during edging.

3.6 CURING

Concrete shall be continuously protected against loss of moisture and rapid temperature changes for at least 7 days from the completion of finishing operations. Unhardened concrete shall be protected from rain and flowing water. During hot weather with low humidity and/or wind, the Contractor shall institute measures to prevent plastic shrinkage cracks from developing. ACI 305R contains means of predicting plastic shrinkage cracking and preventative measures. Plastic shrinkage cracks that occur shall be filled by injection of epoxy resin after the concrete hardens. Plastic shrinkage cracks shall never be troweled over or filled with slurry. Curing shall be accomplished by one of the following methods.

3.6.1 Membrane Curing

A uniform coating of white-pigmented membrane-forming curing compound shall be applied to the entire exposed surface of the concrete including pavement

edges as soon as the free water has disappeared from the surface after finishing. If evaporation is high and no moisture is present on the surface even though bleeding has not stopped, fog sprays shall be used to keep the surface moist until setting of the cement occurs. Curing compound shall then be immediately applied. Curing compound shall be applied to the finished surfaces by means of a self-propelled automatic spraying machine, equipped with multiple spraying nozzles with wind shields, spaning the newly paved lane. The curing compound shall be applied at a maximum application rate of 200 square feet per gallon. The application of curing compound by hand-operated, mechanical powered pressure sprayers will be permitted only on odd widths or shapes of slabs where indicated and on concrete surfaces exposed by the removal of forms. The compound shall form a uniform, continuous, cohesive film that will not check, crack, or peel and that will be free from pinholes and other discontinuities. Areas where the curing compound develops the above defects or is damaged by heavy rainfall, sawing or other construction operations within the curing period, shall be immediately resprayed.

3.7 JOINTS

No deviation from the jointing pattern shown on the drawings shall be made without written approval of the Fort Worth District Corps of Engineers, CENWO-ED-GA. All joints shall be straight, perpendicular to the finished grade of the pavement, and continuous from edge to edge or end to end of the pavement with no abrupt offset and no gradual deviation greater than 1/2 inch.

3.7.1 Longitudinal Construction Joints

Dowels shall be installed in the longitudinal construction joints, or the edges shall be thickened as indicated.

3.7.2 Transverse Construction Joints

Transverse construction joints shall be installed at a planned transverse joint, at the end of each day's placing operations and when concrete placement is interrupted. Transverse construction joints shall be constructed either by utilizing headers and hand placement and finishing techniques, or by placing concrete beyond the transverse construction joint location and then saw cutting full depth and removing concrete back to the transverse construction joint location. For the latter case, dowels shall be installed using methods for dowels installed in hardened concrete described above. All transverse construction joints shall be dowelled.

3.7.3 Expansion Joints

Expansion joints shall be formed where indicated, and about any structures and features that project through or into the pavement, using preformed joint filler of the type, thickness, and width indicated, and shall extend the full slab depth. Edges of the concrete at the joint face shall be edged. The joint filler strips shall be installed to form a recess at the pavement surface to be filled with joint sealant. Expansion joints shall be constructed with thickened edges for load transfer.

3.7.4 Contraction Joints

Transverse and longitudinal contraction joints shall be of the weakened-plane or dummy type. Longitudinal contraction joints shall be constructed by sawing a groove in the hardened concrete with a power-driven saw. Transverse contraction joints shall be constructed in conformance with requirements for sawed joints.

3.7.4.1 Sawed Joints

Sawed contraction joints shall be constructed by sawing a groove in the concrete with a 1/8 inch blade to the indicated depth. The time of initial sawing shall vary depending on existing and anticipated weather conditions and shall be such as to prevent uncontrolled cracking of the pavement. Sawing of the joints shall commence as soon as the concrete has hardened sufficiently to permit cutting the concrete without chipping, spalling, or tearing. The joints shall be sawed at the required spacing consecutively in the sequence of the concrete placement. Sawing at a given joint location shall be discontinued when a crack develops ahead of the saw cut. Immediately after the joint is sawed, the saw cut and adjacent concrete surface shall be thoroughly flushed with water until all waste from sawing is removed from the joint. The surface shall be resprayed with curing compound as soon as free water disappears. The top of the joint opening and the joint groove at exposed edges shall be tightly sealed with cord or backer rod before the concrete in the region of the joint is resprayed with curing compound.

3.7.5 Thickened Edge Joints

Underlying material in the transition area shall meet the requirements for smoothness and compaction specified for all other areas of the underlying material.

3.8 REPAIR, REMOVAL, AND REPLACEMENT OF SLABS

New pavement slabs that contain full-depth cracks shall be removed and replaced, as specified herein at no cost to the Government. Removal and replacement shall be full depth, shall be full width of the paving lane, and the limit of removal shall be from each original transverse joint . The Contracting Officer will determine whether cracks extend full depth of the pavement and may require minimum 6 inch diameter cores to be drilled on the crack to determine depth of cracking. Cores shall be drilled and the hole later filled by the Contractor with a well consolidated concrete mixture bonded to the walls of the hole with epoxy resin. Drilling of cores and refilling holes shall be at no expense to the Government. Cracks that do not extend full depth of slab shall be cleaned and then pressure injected with epoxy resin, Type IV, Grade 1. The Contractor shall ensure that the crack is not widened during epoxy resin injection. Where a full depth crack intersects the original transverse joint, the slab(s) containing the crack shall be removed and replaced, with dowels installed, as required below. Spalls along joints shall be repaired as specified.

3.8.1 Removal and Replacement of Full Slabs

Unless there are keys or dowels present, all edges of the slab shall be sawcut full depth. If keys, dowels, or tie bars are present along any edges, these edges shall be sawed full depth 6 inches from the edge if only keys are present, or just beyond the end of dowels or tie bars if they are present. These joints shall then be carefully sawed on the joint line to within 1 inch of the depth of the dowel or key. The main slab shall be further divided by sawing full depth, at appropriate locations, and each piece lifted out and removed. The narrow strips along keyed or doweled edges shall be carefully broken up and removed. Care shall be taken to prevent damage to the dowels, tie bars, or keys or to concrete to remain in place. Protruding portions of dowels shall be painted and lightly oiled. The joint face below keys or dowels shall be suitably trimmed so that there is no abrupt offset. If underbreak occurs at any point along any edge, the area shall be hand-filled with concrete, producing an even joint face from top to bottom, before replacing the removed slab. If underbreak over 4 inches deep occurs, the entire slab containing the underbreak shall be removed and replaced. Where there are no dowels, tie bars, or keys on an edge, or where they have been damaged, dowels of the size and spacing as specified for other joints in similar pavement shall be installed by epoxy grouting them into holes drilled into the existing concrete. Original damaged dowels or tie bars shall be cut off flush with the joint face. All four edges of the new slab shall thus contain dowels or original keys or original tie bars. Prior to placement of new concrete, the underlying material shall be graded and recompacted, and the surfaces of all four joint faces shall be cleaned of all loose material and contaminants, and coated with a double application of membrane forming curing compound as bond breaker. Placement of concrete shall be as specified for original construction. The resulting joints around the new slab shall be prepared and sealed as specified.

3.8.2 Repairing Spalls Along Joints

Spalls along joints and cracks shall be repaired by first making a vertical saw cut at least 1 inch outside the spalled area and to a depth of at least 2 inches. Saw cuts shall be straight lines forming rectangular areas. The concrete between the saw cut and the joint, or crack, shall be chipped out to remove all unsound concrete. The cavity shall be thoroughly cleaned with high pressure water jets supplemented with compressed air to remove all loose material. Immediately before filling the cavity, a prime coat shall be applied to the dry cleaned surface of all sides and bottom of the cavity, except any joint face. The prime coat shall be applied in a thin coating and scrubbed into the surface with a stiff-bristle brush. Prime coat for portland cement repairs shall be a neat cement grout and for epoxy resin repairs shall be epoxy resin, Type III, Grade 1. The cavity shall be filled with low slump portland cement concrete or mortar, or with epoxy resin concrete or mortar. Portland cement concrete shall be used for larger spalls, those more than 1/3 cu. ft. in size after removal operations; portland cement mortar shall be used for spalls between 0.03 and 1/3 cu. ft; and epoxy resin mortar or Type III, Grade 3 epoxy resin for those spalls less than 0.03 cu. ft. in size after removal operations. Portland cement concretes and mortars shall be very low slump mixtures, proportioned, mixed, placed, tamped, and cured. If the materials and procedures are approved in writing, latex modified concrete mixtures may be used for repairing spalls less than 1/3 cu.ft. in size. Epoxy resin

mortars shall be made with Type III, Grade 1, epoxy resin, using proportions, mixing, placing, tamping and curing procedures as recommended by the manufacturer. Any repair material on the surrounding surfaces of the existing concrete shall be removed before it hardens. Where the spalled area abuts a joint, an insert or other bond-breaking medium shall be used to prevent bond at the joint face. A reservoir for the joint sealant shall be sawed to the dimensions required for other joints. In lieu of sawing, spalls not adjacent to joints, and popouts, both less than 6 inches in maximum dimension, may be prepared by drilling a core 2 inches in diameter greater than the size of the defect, centered over the defect, and 2 inches deep or 1/2 inch into sound concrete, whichever is greater. The core hole shall be repaired as specified above for other spalls.

3.8.3 Areas Defective in Plan Grade or Smoothness

In areas not meeting the specified limits for surface smoothness and plan grade, high areas shall be reduced to attain the required smoothness and grade, except as depth is limited below. High areas shall be reduced by grinding the hardened concrete with a surface grinding machine after the concrete is 14 days or more old. The depth of grinding shall not exceed 1/4 inch. All pavement areas requiring plan grade or surface smoothness corrections in excess of the specified limits, shall be removed and replaced. In pavement areas given a wire comb or tined texture, areas exceeding 25 square feet that have been corrected by rubbing or grinding shall be retextured by grooving machine sawn grooves meeting the requirements for the wire comb or tined texture. All areas in which grinding has been performed will be subject to the thickness tolerances specified in paragraph Thickness. Any grinding performed on individual slabs with excessive deficiencies shall be performed at the Contractor's own decision without entitlement to additional compensation if eventual removal of the slab is required.

3.9 EXISTING CONCRETE PAVEMENT REMOVAL AND REPAIR

Existing concrete pavement shall be removed as indicated and as specified in Section 02220 DEMOLITION modified, and expanded as specified herein. Removal, repair and replacement shall be made as indicated and as specified in paragraph REPAIR, REMOVAL, AND REPLACEMENT OR SLABS.

3.10 PAVEMENT PROTECTION

The Contractor shall protect the pavement against all damage prior to final acceptance of the work. Traffic shall be excluded from the new pavement. As a construction expedient in paving intermediate lanes between newly paved pilot lanes, operation of the hauling equipment will be permitted on the new pavement after the pavement has reached an in-place compressive stength of 4500 psi and the joints have been sealed or otherwise protected. All new pavement shall have an in-place compressive stength of 4500 psi on 02 January, 2002. All new and existing pavement carrying construction traffic or equipment shall be continuously kept completely clean. Special cleaning and care shall be used where Contractor's traffic uses or crosses active airfield pavement.

3.11 TESTING AND INSPECTION FOR CONTRACTOR QUALITY CONTROL (CQC)

Paragraph ACCEPTABILITY OF WORK contains additional CQC requirements. The Contractor shall perform the inspection and tests described below and, based upon the results of these inspections and tests, shall take the action required and submit reports as specified. When, in the opinion of the Contracting Officer, the paving operation is out of control, concrete placement shall cease.

3.11.1 Batch Plant Control

A daily report shall be prepared indicating checks made for scale accuracy with test weights, checks of batching accuracy, and corrective action taken prior to and during placement for weighing or batching, type and source of cement used, type and source of pozzolan used, amount and source of admixtures used, aggregate source, the required aggregate and water masses per cubic yd, amount of water as free moisture in each size of aggregate, and the batch aggregate and water masses per cubic yd. for each class of concrete batched during each day's plant operation.

3.11.2 Concrete Mixture

a. Air Content Testing. Air content tests shall be made when test specimens are fabricated. In addition, at least two other tests for air content shall be made on randomly selected batches of each separate concrete mixture produced during each 8-hour period of paving. Whenever air content reaches specified limits, an immediate confirmatory test shall be made. If the second test also shows air content at or exceeding specified limits, an adjustment shall immediately be made in the amount of air-entraining admixture batched to bring air content within specified limits. If the next adjusted batch of concrete is not within specified limits, concrete placement shall be halted until concrete air content is within specified limits.

b. Slump Testing. Slump tests shall be made when test specimens are fabricated. Additional tests shall be made when excessive variation in workability is reported by the placing foreman or Government inspector. Whenever slump approaches the maximum limit, an adjustment shall immediately be made in the batch masses of water and fine aggregate, without exceeding the maximum w/(c+p). When a slump result exceeds the specification limit, no further concrete shall be delivered to the paving site until adjustments have been made and slump is again within the limit.

c. Temperature. The temperature of the concrete shall be measured when strength specimens are fabricated.

d. Concrete Strength Testing. Four (4) cylinders from the same batch shall be fabricated, cured and tested for compressive strength, testing two cylinders at 7-day and two cylinders at 28-day age. A minimum of one set of four (4) cylinders shall be fabricated, cured and tested for each shift of concrete placement. Control charts for strength, showing the 7-day and 28-day CQC compressive strengths, and the 28-day required compressive strength, shall be

maintained and submitted with weekly CQC Reports. A minimum of two (2) additional cylinders from the same batch shall be fabricated, cured and tested for compressive strenth by the Contractor to demonstrate that the new pavements compressive strength equals or exceeds 4500 psi. The age of the addtional cylinders at the time of testing will be determined by the Contractor. The compressive strength of all in-place pavements shall meet or exceed 4500 psi on January 02,2002.

3.11.3 Inspection Before Placing

Underlying materials, joint locations and types, construction joint faces, forms, reinforcing, dowels, and embedded items shall be inspected by a Registered Engineer in sufficient time prior to each paving operation in order to certify to the Contracting Officer that they are ready to receive concrete. The results of each inspection shall be reported in writing, and the certification signed by the Registered Engineer, prior to each days' paving.

3.11.4 Paving Operations

The placing foreman shall supervise all placing and paving operations, shall determine that the correct quality of concrete is placed in each location as shown, shall insure that the concrete is consolidated full depth and that finishing is performed as specified. The placing foreman shall be responsible for measuring and recording concrete temperatures and ambient temperature hourly during placing operations, weather conditions, time of placement, volume of concrete placed, and method of paving and any problems encountered.

3.11.5 Curing Inspection

a. Moist Curing Inspections. Each day on both work and non-work days, an inspection shall be made of all areas subject to moist curing. The surface moisture condition shall be noted and recorded. When any inspection finds an area of inadequate curing, immediate corrective action shall be taken, and the required curing period for the area shall be extended by 1 day.

b. Membrane Curing Inspection. At the end of each day's placement, the CQC Representative shall determine the quantity of compound used by measurement of the container; shall determine the area of concrete surface covered; shall then compute the rate of coverage in square feet per gallon and shall also note whether or not coverage is uniform. When the coverage rate of the curing compound is less than that specified or when the coverage is not uniform, the entire surface shall be sprayed again.

3.11.6 Cold-Weather Protection

At least once per day, an inspection shall be made of all areas subject to cold-weather protection. Any deficiencies shall be noted, corrected, and reported.

3.11.7 Reports

All results of tests or inspections conducted shall be reported informally as they are completed and in writing daily. A weekly report, signed by a registered engineer, shall be prepared for the updating of control charts and test data, and all CQC inspections and actions covering the entire period from the start of the construction through the current week. Reports of failures and the action taken shall be confirmed in writing in the routine reports. The Contracting Officer has the right to examine all CQC records. A copy of weekly reports shall be faxed to the Design District Pavement or Geotechnical Engineer. At the completion of concrete placement, a certification report shall be prepared containing mix designs, all updated control charts and concrete test data, quality control reports, smoothness reports, and other pertinent data on the concrete, with a certification by a registered engineer that the concrete placed meets all specification requirements. A copy of the certification report shall be mailed to the Design District pavement or Geotechnical Engineer.

-- End of Section --

SECTION 16526

AIRFIELD LIGHTING AND VISUAL NAVIGATION AIDS
[Am# 1]

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI C119.1	(1986; R 1997) Sealed Insulated Underground Connector Systems Rated 600 Volts

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 123/A 123M	(1997a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 153/A 153M	(1998) Zinc Coating (Hot Dip) on Iron and Steel Hardware
ASTM A 780	(1993a) Repair of Damaged and Uncoated areas of Hot-Dipped Galvanized Coatings
ASTM D 709	(1992; R 1997) Laminated Thermosetting Materials
ASTM D 1248	(1984; R 1989) Polyethylene Plastics Molding and Extrusion Materials
ASTM D 1654	(1992) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments

ASSOCIATION OF EDISON ILLUMINATING COMPANIES (AEIC)

AEIC CS5	(1994; CS5a-1995) Cross Linked-Polyethylene Insulated Shielded Power Cables Rated 5 Through 46 kV

FACTORY MUTUAL ENGINEERING AND RESEARCH (FM)

FM P7825a	(1998) Approval Guide Fire Protection
FM P7825b	(1998) Approval Guide Electrical Equipment

FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 150/5345-7	(Rev D; Change 1) L-824 Underground Electrical Cable for Airport Lighting Circuits
FAA AC 150/5345-26	(Rev B; Changes 1 & 2) L-823 Plug and Receptacle, Cable Connectors
FAA AC 150/5345-42	(Rev C; Change 1) Airport Light Bases, Transformer Houses, Junction Boxes and Accessories
FAA AC 150/5345-44	(Rev F;) Taxiway and Runway Signs
FAA AC 150/5345-46	(Rev B) Runway and Taxiway Light Fixtures
FAA AC 150/5345-47	(Rev A) Isolation Transformers for Airport Lighting Systems
FAA AC 150/5370-10	(Rev A; Changes 1 thru 11) Specifying Construction of Airports
FAA C-6046	(1978) Frangible Coupling Type I and Type 1A, Details
FAA E-982	(Rev H; Notice 1) PAR-56 Lampholder

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE C2	(1997) National Electrical Safety Code
IEEE STD 48	(1998) Standard Test Procedures and Requirements for Alternating-Current Cable Terminations 2.5 kV through 765 kV

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA 250	(1991) Enlcosures for Electrical Equipment (1000 volts Maximum)
NEMA RN 1	(1989) Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
NEMA TC 2	(1990) Electrical Polyvinyl Chloride (PVC) Tubing (EPT) and Conduit (EPC-40 and EPC-80)
NEMA TC 3	(1990) PVC Fittings for Use with Rigid PVC Conduit and Tubing

NEMA TC 6	(1990) PVC and ABS Plastic Utilities Duct for Underground Installation
NEMA WC 3	(1992) Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
NEMA WC 7	(1991; Rev 3 1996) Cross-Linked-Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
NEMA WC 8	(1991; Rev 3 1996) Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(1999) National Electrical Code

THE SOCIETY FOR PROTECTIVE COATING (SSPC)

SSPC Paint 20	(1991) Zinc-Rich Primers (Type I - "Inorganic" and Type II - "Organic")

UNDERWRITERS LABORATORIES (UL)

UL 6	(1997) Rigid Metal Conduit
UL 44	(1997; Rev Mar 1999) Thermoset-Insulated Wires and Cables
UL 83	(1998) Thermoplastic-Insulated Wires and Cables
UL 486A	(1991; Rev thru Dec 1998) Wire Connectors and Soldering Lugs for Use with Copper Conductors
UL 510	(1994; Rev thru Apr 1998) Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape
UL 514A	(1996; Rev Jul 1998)) Metallic Outlet Boxes
UL 854	(1996; Rev Apr 1998) Service-Entrance Cables
UL 1242	(1996; Rev Mar 1998) Intermediate Metal Conduit

UL Elec Const Dir	(1998) Electrical Construction Equipment Directory

1.2 GENERAL REQUIREMENTS

Items of the same classification shall be identical including equipment, assemblies, parts, and components.

1.2.1 Code Compliance

The installation shall comply with the requirements and recommendations of NFPA 70 and IEEE C2 and local codes where required.

1.2.2 Standard Product

Material and equipment shall be a standard product of a manufacturer regularly engaged in the manufacture of the product and shall essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening.

1.2.3 Prevention of Corrosion

1.2.3.1 Metallic Materials

Metallic materials shall be protected against corrosion as specified. Aluminum shall not be used.

1.2.3.2 Ferrous Metal Hardware

Ferrous metal hardware shall be hot-dip galvanized in accordance with ASTM A 123/A 123M and ASTM A 153/A 153M.

1.2.3.3 Luminaires Fabricated from Ferrous Metals

Luminaires fabricated from ferrous metals, unless hot-dip galvanized or of porcelain enamel finish shall be factory finished with a weather-resistant finish in accordance with paragraphs FACTORY COATING and FINISHING, except exposure shall be 200 hours. Finish color shall be the manufacturer's standard, unless otherwise indicated.

1.2.4 Unusual Service Conditions

Items furnished under this section shall be specifically suitable for the following unusual service conditions:

1.2.4.1 Other

Material or equipment to be installed underground; in handholes or in light bases shall be suitable for submerged operation.

1.2.5 Verification of Dimensions

The Contractor shall become familiar with details of the work, verify dimensions in the field, and advise the Contracting Officer of any

discrepancy before performing any work.

1.3 SYSTEM DESCRIPTION

The airfield lighting and visual navigation aids shall consist of the removal and reinstallation of existing taxiway lighting and displaced threshold. New lighting bases, cable handholes and pullboxes shall be provided as indicated on the plans. Existing light fixtures and transformers shall be reinstalled on new light bases.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Lighting and Navigation Aids

Coordination drawings consisting of composite drawings showing coordination of work of one trade with that of other trades and with the structural and architectural elements of the work. Drawings shall be in sufficient detail to show overall dimensions of related items, clearances, and relative locations of work in allotted spaces. Drawings shall indicate where conflicts or clearance problems exist between the various trades.

As-Built Drawings; G

Drawings that provide current factual information including deviations from, and amendments to the drawings and changes in the work, concealed and visible, shall be provided as instructed. The as-built drawings shall show installations with respect to fixed installations not associated with the systems specified herein. Cable and wire shall be accurately identified as to direct-burial or in conduit and shall locate the connection and routing to and away from bases, housings, and boxes.

SD-03 Product Data

Materials and Equipment; G

A complete itemized listing of equipment and materials proposed for incorporation into the work. Each itemization shall include an item number, the quantity of items proposed, and the name of the manufacturer. Data composed of catalog cuts, brochures, circulars, specifications and product data, and printed information in sufficient detail and scope to verify compliance with requirements of the contract documents.

SD-06 Test Reports

Field Quality Control; G

Upon completion and testing of the installed system, performance test reports are required in booklet form showing all field tests performed to provide compliance with the specified performance criteria.

Field test reports shall be written, signed and provided as each circuit or installation item is completed. Field tests shall include resistance-to-ground and resistance between conductors, and continuity measurements for each circuit. For taxiway E series circuit the input voltage and output current of the constant current regulator at each intensity shall be measured. A visual inspection of the lights operation, or of the markings appearance, or of the installation of fixtures or units installed shall be reported.

Inspection; G

Inspection reports shall be prepared and provided as each stage of installation is completed. These reports shall identify the activity by contract number, location, quantity of material placed, and compliance with requirements.

SD-07 Certificates

General Requirements; G

Certifications, when specified or required, including Certification of the Qualifications of Medium-Voltage Cable Installers, Certified Factory and Field Test Reports, and Certificates of Compliance submitted in lieu of other proofs of compliance with these contract provisions. A certification that contains the names and the qualifications of persons recommended to perform the splicing and termination of medium-voltage cables approved for installation under this contract shall be included. The certification shall indicate that any person recommended to perform actual splicing and termination has been adequately trained in the proper techniques and has had at least 3 recent years of experience in splicing and terminating the same or similar types of cables approved for installation. Any person recommended by the Contractor may be required to perform a dummy or practice splice and termination, in the presence of the Contracting Officer, before being approved as a qualified installer of medium-voltage cables. If that additional requirement is imposed, the Contractor shall provide short sections of the approved types of cables with the approved type of splice and termination kits, and detailed manufacturer's instruction for the proper splicing and termination of the approved cable types. The certification shall be prepared in conformance with paragraph CERTIFICATES OF COMPLIANCE in the SPECIAL CONTRACT REQUIREMENTS, and shall be accompanied by satisfactory proof of the training and experience of persons recommended by the Contractor as cable installers. The SF sub 6

gas pressurized cable and conduit system installer must be trained and certified in installation of this type of system and must be approved by the manufacturer of the system.

Materials and Equipment; G

When equipment or materials are specified to conform to the standards or publications and requirements of AASHTO, ANSI, ASTM, AEIC, FM, IEEE, IES, NEMA, NFPA, or UL, or to an FAA, FS, or MS, proof that the items furnished under this section of the specifications conform to the specified requirements shall be included. The label or listing in UL Elec Const Dir or in FM P7825a, FM P7825b or the manufacturer's certification or published catalog specification data statement that the items comply with applicable specifications, standards, or publications and with the manufacturer's standards will be acceptable evidence of such compliance. Certificates shall be prepared by the manufacturer when the manufacturer's published data or drawings do not indicate conformance with other requirements of these specifications.

PART 2 PRODUCTS

2.1 MATERIALS

Equipment and materials shall be new unless indicated or specified otherwise. Materials and equipment shall be labelled when approved by Underwriters Laboratories (UL) or Factory Mutual (FM) System. Askarel and insulating liquids containing polychlorinated biphenyls (PCB's) will not be allowed in any equipment. Equipment installed below grade in vaults, manholes, and handholes shall be the submersible type.

2.1.1 Electrical Tape

Electrical tape shall be UL 510 plastic insulating tape.

2.1.2 Nameplates(NOT USED)

2.1.3 Conduit, Conduit Fittings, and Boxes

2.1.3.1 Rigid Steel or Intermediate Metal Conduit (IMC) and Fittings

The metal conduit and fittings shall be UL 6 and UL 1242, respectively, coated with a polyvinylchloride (PVC) sheath bonded to the galvanized exterior surface, nominal 40 mils thick, conforming to NEMA RN 1.

2.1.3.2 Flexible Metal Conduit (NOT USED)

2.1.3.3 Outlet Boxes for Use with Steel Conduit, Rigid or Flexible

These outlet boxes shall be UL 514A, cast metal with gasket closures.

2.1.3.4 Plastic Duct for Concrete Encased Burial

These ducts shall be provided as specified in Section 16375, ELECTRICAL

DISTRIBUTION SYSTEM, UNDERGROUND.

2.1.3.5 Plastic Conduit for Direct Burial

This plastic conduit shall be provided as specified in Section 16375, ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.

2.1.3.6 Frangible Couplings and Adapters

These frangible couplings shall be in accordance with FAA C-6046. Upper section of frangible coupling shall be provided with one of the following:

a. Unthreaded for slip-fitter connections.

b. 2-13/32 inch 16N-1A modified thread for nut and compression ring to secure 2 inch EMT.

c. 2 inch 11-1/2-N.P.T. (tapered) with 7/32 inch nominal wall thickness to accept rigid conduit coupling.

d. Frangible Couplings for specialized applications as approved.

e. Electrical Metallic Tubing UL 797, where indicated for use with frangible couplings and adapters.

2.1.4 Wire and Cable

Conductors shall be copper.

2.1.4.1 Conductor Sizes

Conductor size shall conform to American Wire Gage (AWG). Conductor sizes larger than No. 8 AWG shall be stranded. No. 8 AWG and smaller may be solid or stranded unless otherwise indicated.

2.1.4.2 Low Voltage Wire and Cable

UL 854, Type USE, 600 volts shall be used for underground low voltage power cables. UL 83, Type THWN or UL 44, Type XHHW shall be used for secondary series lighting circuits to be installed in pavement.

2.1.4.3 Power Cables for Use in Airfield Lighting

Power cables shall be rated 5 kV, 133 percent insulation level, with shield and jacket conforming to NEMA WC 7 for crosslinked polyethylene or NEMA WC 8 for ethylene-propylene rubber insulated cables.

2.1.4.4 Wire and Cable for Airfield Lighting Systems

a. Airfield lighting cable shall be FAA AC 150/5345-7, Type L-824 for crosslinked polyethylene Type C 5000-volt cable. Series airfield lighting cable shall be unshielded.

bCounterpoise Wire. No. 4 AWG bare stranded copper, annealed or soft drawn.

2.1.4.5 Cable Tags

Cable tags for each cable or wire shall be installed at duct entrances entering or leaving handholes and at each terminal within the lighting vault. Cable tags shall be stainless steel, bronze, lead strap, or copper strip, approximately 1/16 inch thick or hard plastic 1/8 inch thick suitable for immersion in salt water and impervious to petroleum products and shall be of sufficient length for imprinting the legend on one line using raised letters. Cable tags shall be permanently marked or stamped with letters not less than 1/4 inch in height as indicated. Two-color laminated plastic is acceptable. Plastic tags shall be dark colored with markings of light color to provide contrast so that identification can be easily read. Fastening material shall be of a type that will not deteriorate when exposed to water with a high saline content and to petroleum products.

2.1.4.6 Concrete Markers for Direct Buried Systems

Concrete markers shall be as specified in Section 16375, ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.

2.1.5 Ground Rods

Ground rods shall be sectional copper-clad steel with diameter adequate to permit driving to full length of the rod, but not less than 3/4 inch in diameter and not more than 10 feet long, unless indicated otherwise.

2.1.6 Lightning Arresters (NOT USED)

2.1.7 Surge Protection (NOT USED)

2.1.8 Cable Connectors and Splices

Cable connectors in accordance with FAA AC 150/5345-26, Item L-823 shall be used for connections and splices appropriate for the type of cable. Other types of cable connectors and splices shall be of copper alloys for copper conductors, aluminum alloys for aluminum-composition conductors and a type designed to minimize galvanic corrosion for copper to aluminum-composition conductors. For FAA Type L-824 lighting cable, connectors shall be FAA AC 150/5345-26, Type L-823.

2.1.9 Transformers (NOT USED)

2.1.10 Light Bases

Light bases shall be FAA AC 150/5345-42 Type L-867. Steel bases, Class 1, Size as indicated, shall be provided as indicated or as required to accommodate the existing fixture or device installed thereon if diameter is not shown.

2.1.10.1 Accessories

Base plates, cover plates, and adapter plates shall be provided to accommodate various sizes of fixtures. Bolts shall be stainless steel.

2.1.11 Sealant for Fixtures and Wires in Drilled Holes or Saw Kerfs (NOT USED)

2.1.12 Lighting Fixtures

The lighting fixtures for the airfield and taxiway lighting shall be as shown in the contract drawings or as required in other contract documents. All existing relocated fixtures and lamps shall be cleaned and tested before placing back in service.

2.2 TAXIWAY LIGHTING SYSTEMS

Taxiway lighting systems shall include relocated edge lights and guidance signs. These systems shall also include the new associated equipment, power supplies and controls, mounting devices, and interconnecting wiring to provide a complete system as specified.

2.2.1 Taxiway Edge Lights

Taxiway edge lights are existing and shall be relocated to new light bases as indicated on the contract drawings.

2.3 RUNWAY LIGHTING SYSTEM

Runway lights include relocated runway threshold lights and the associated equipment and interconnecting wiring to provide complete systems as indicated and specified herein. In-pavement light fixtures shall be able to withstand a minimum static single wheel load of 50,000 pounds.

2.3.1 Runway Threshold and End Lights

The threshold and end lights are existing and shall be relocated to new light bases as indicated on the contract drawings.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

Circuits installed underground shall conform to the requirements of Section 16375, ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND, except as required herein. Steel conduits installed underground shall be installed and protected from corrosion in conformance with the requirements of Section 16415 ELECTRICAL WORK, INTERIOR. Except as covered herein, excavation, trenching, and backfilling shall conform to the requirements of Section 02316 EXCAVATION, TRENCHING, AND BACKFILLING FOR UTILITIES SYSTEMS. Concrete work shall conform to the requirements of Section 03300 CAST-IN-PLACE STRUCTURAL CONCRETE.

3.2 CABLES, GENERAL REQUIREMENTS

The type of installation, size and number of cables shall be as indicated. Conductors larger than No. 8 AWG shall be stranded. Loads shall be divided as evenly as practicable on the various phases of the system. Manufacturer's written recommendations shall be furnished for each type of splice and medium-voltage cable joint and termination, and for fireproofing

application methods, and shall be approved before any work is done. Medium-voltage cable joints and terminations shall be the standard product of a manufacturer and shall be either of the factory preformed type or of the kit type containing tapes and other required parts. Medium-voltage cable joints shall be made by qualified cable splicers. Compounds and tapes shall be electrical grade suitable for the cable insulation provided and shall use design materials and techniques recommended by the manufacturer. Maximum length of cable pull and cable pulling tensions shall not exceed the cable manufacturer's recommendations.

3.2.1 Duct Line Installation

Cables shall be installed in duct lines where indicated. Cable splices in low-voltage cables shall be made in handholes only, except as otherwise noted. Cable joints in medium-voltage cables shall be made in handholes only. Neutral and ground conductors shall be installed in the same duct with their associated phase conductors. Counterpoise cable shall be installed in a separate duct or direct-burial not less than 6 inches above the uppermost duct containing electrical cable. **[AM #1] The counterpoise shall not run through manholes, hand holes, pullboxes, or lighting cans. The counterpoise shall run around manholes, hand holes, pullboxes, and lighting cans. The counterpoise shall not be connected to the system ground.**

3.2.2 Direct-Burial Installation

Cables in conduit shall be buried directly in the earth as indicated. Minimum cover from the top of a duct to finished grade shall be 24 inches for medium-voltage cables but not less than the depth of the frost line. Counterpoise cable shall be not less than 6 inches above the uppermost electrical cable but not less than the depth of the frost line.

3.2.2.1 Trenching

Trenches for direct-burial conduit shall be excavated to depths required to provide the minimum necessary conduit cover. Bottoms of trenches shall be smooth and free of stones and sharp objects.

3.2.2.2 Cable Installation (NOT USED)

3.2.2.3 Other Requirements (NOT USED)

3.2.2.4 Medium-Voltage Cable Joints or Low-Voltage Cable Splices

Cable joints or splices are not permitted in runs of 1000 feet or less, nor at intervals of less than 1000 feet in longer runs, except as required for taps. Locations of cable joints or splices in shorter intervals, where required to avoid obstructions or damage to cables, shall be approved.

3.2.2.5 Surface Markers

Markers shall be located every 500 feet along duct runs and at changes in direction of duct runs. Markers shall be constructed as indicated.

3.2.3 Connection to Buildings (NOT USED)

3.3 MEDIUM-VOLTAGE CABLES

Medium-voltage cables shall be suitable for a rated circuit voltage of 5 kV. Other parts of the cable system such as joints and terminations shall have ratings not less than the rating of the cables on which they are installed. Separable insulated connectors shall have nominal voltage ratings coordinated to associated apparatus ratings rather than cable ratings when used to connect cable to apparatus. Cables shall be provided with 133 percent insulation level. Neutral conductors of grounded neutral systems shall be of the same insulation material as phase conductors, except that a 600-volt insulation rating is acceptable.

3.3.1 Cable Joints

Shields shall be applied as required to continue the shielding system through each entire cable joint. Shields may be integrally molded parts of preformed joints. Shields shall be grounded at each joint.

3.3.1.1 Types

Separable insulated connectors of suitable construction or standard splice kits shall be used for single-conductor and two-conductor cables. The connectors shall be of FAA AC 150/5345-26 type. Cable joints for which acceptable separable connector kits are not available may use factory preformed splices if approved.

3.3.1.2 Requirements

Cable joints shall provide insulation and jacket equivalent to that of the associated cable. Lead sleeves shall be provided for lead-covered cables. Armored cable joints shall be enclosed in compound-filled, cast-iron or alloy, splice boxes equipped with stuffing boxes and armor clamps of a suitable type and size for the cable being installed.

3.3.2 Terminations

Terminations shall be IEEE STD 48, Class 1 or Class 2, of the molded elastomer, wet-process porcelain, prestretched elastomer, heat-shrinkable elastomer, or taped type. Acceptable elastomers are track-resistant silicone rubber or track-resistant ethylene propylene compounds, such as ethylene propylene rubber or ethylene propylene diene monomer. Separable insulated connectors may be used for apparatus terminations, when such apparatus is provided with suitable bushings. Terminations shall be of the outdoor type, except that where installed inside outdoor equipment housings which are sealed against normal infiltration of moisture and outside air, indoor, Class 2 terminations are acceptable. Class 3 terminations are not acceptable. Terminations, where required, shall be provided with mounting brackets suitable for the intended installation and with grounding provisions for the cable shielding, metallic sheath, and armor.

3.3.2.1 Factory Preformed Type

Molded elastomer, wet-process porcelain, prestretched, and heat-shrinkable terminations shall utilize factory preformed components to the maximum extent practicable rather than tape build-up. Terminations shall have basic impulse levels as required for the system voltage level. Leakage distances shall pass the wet withstand voltage test required by IEEE STD 48 for the next higher BIL level.

3.3.2.2 Taped Terminations

Taped terminations shall use standard termination kits providing suitable terminal connectors, field-fabricated stress cones, and rain hoods. Terminations shall be at least 12-1/2 inches long from the end of the tapered cable jacket to the start of the terminal connector, or not less than the kit manufacturer's recommendations, whichever is greater.

3.4 LOW-VOLTAGE CABLES

Cable shall be rated 600 volts. Other parts of cable systems such as splices and terminations shall be rated at not less than 600 volts. Splices in wires No. 10 AWG and smaller shall be made with an insulated, solderless, pressure type connector, conforming to the applicable requirements of UL 486A. Splices in wires No. 8 AWG single conductor cable shall be made with FAA AC 150/5345-26 Type L-823 connectors. Splices below grade or in wet locations shall be sealed type conforming to ANSI C119.1 or shall be waterproofed by a sealant-filled, thick wall, heat shrinkable, thermosetting tubing or by pouring a thermosetting resin into a mold that surrounds the joined conductors.

3.5 DUCT LINES

Duct lines shall be non-encased direct-burial, thick-wall type. Low-voltage lines run elsewhere may be non-encased direct-burial, thick-wall type.

3.5.1 Requirements

Numbers and sizes of ducts shall be as indicated. Duct lines shall be laid with a minimum slope of 4 inches per 100 feet. Depending on the contour of the finished grade, the high point may be at a terminal, a manhole, a handhold, or between manholes or handholes. Manufactured 90 degree duct bends may be used only for pole or equipment risers, unless specifically indicated as acceptable. The minimum manufactured bend radius shall be 18 inches for ducts of less than 3 inches diameter, and 36 inches for ducts 3 inches or greater in diameter. Otherwise, long sweep bends having a minimum radius of 25 feet shall be used for a change of direction of more than 5 degrees, either horizontally or vertically. Both curved and straight sections may be used to form long sweep bends as required, but the maximum curve shall be 30 degrees and manufactured bends shall be used. Ducts shall be provided with end bells when duct lines terminate in manholes or handholes. Duct line markers shall be provided as indicated at the ends of long duct line stubouts or for other ducts whose locations are indeterminate because of duct curvature or terminations at completely below-grade structures. In lieu of markers, a 5 mil brightly colored plastic tape not less than 3 inches in width and suitably inscribed at not

more than 10 feet on centers with a continuous metallic backing and a corrosion-resistant 1 mil metallic foil core to permit easy location of the duct line, shall be placed approximately 12 inches below finished grade levels of such lines.

3.5.2 Treatment

Ducts shall be kept clean of concrete, dirt, or foreign substances during construction. Field cuts requiring tapers shall be made with proper tools and match factory tapers. After a duct line is completed, a standard flexible mandrel shall be used for cleaning followed by a brush with stiff bristles. Mandrels shall be at least 12 inches long and shall have diameters 1/4 inch less than the inside diameter of the duct being cleaned. Pneumatic rodding may be used to draw in lead wires. A coupling recommended by the duct manufacturer shall be used when an existing duct is connected to a duct of different material or shape. Ducts shall be stored to avoid warping and deterioration with ends sufficiently plugged to prevent entry of water or solid substances. Ducts shall be thoroughly cleaned before being laid. Plastic ducts shall be stored on a flat surface and protected from the direct rays of the sun.

3.5.3 Concrete Encasement (NOT USED)

3.5.4 Non-encased Direct-Burial

Top of duct lines shall be below frost line but not less than 24 inches below finished grade. Ducts shall be buried below frost line but in the earth and shall be installed with a minimum of 3 inches of earth around each duct, except that between adjacent electric power and communication ducts, 12 inches of earth is required. Bottoms of trenches shall be graded toward handholes and shall be smooth and free of stones, soft spots, and sharp objects. Where bottoms of trenches comprise materials other than sand or stone-free earth, 3 inch layers of sand or stone-free earth shall be laid first and compacted to approximate densities of surrounding firm soil before installing ducts in direct-contact tiered fashion. Joints in adjacent tiers of duct shall be vertically staggered at least 6 inches. The first 4 inch layer of backfill cover shall be sand or stone-free earth compacted as previously specified. Duct banks may be held in alignment with earth. However, high-tiered banks shall use a wooden frame or equivalent form to hold ducts in alignment prior to backfilling. Selected earth at duct banks shall be thoroughly tamped in 4 to 6 inch layers.

3.5.5 Installation of Couplings

Joints in each type of duct shall be made up in accordance with the manufacturer's recommendations for the particular type of duct and coupling selected and as approved. In the absence of specific recommendations, various types of duct joint couplings shall be made watertight as specified.

3.5.5.1 Asbestos-Cement and Bituminized-Fiber Ducts (NOT USED)

3.5.5.2 Plastic Duct

Duct joints shall be made by brushing a plastic solvent cement on insides

of plastic coupling fittings and on outsides of duct ends. Each duct and fitting shall then be slipped together with a quick one-quarter-turn twist to set the joint tightly.

3.6 HANDHOLES

The handholes shall be as specified in Section 16375 ELECTRICAL DISTRIBUTION SYSTEM, UNDERGROUND.

3.7 WELDING

The welding of supports and metallic ducts and welding or brazing of electrical connections shall be performed by qualified welders.

3.8 CABLE MARKERS

Cable markers or tags shall be provided for each cable at duct entrances entering or leaving handholes and at each termination within the lighting vault. Cables in each handhole shall have not less than two tags per cable, one near each duct entrance hole. Immediately after cable installation, tags shall be permanently attached to cables and wires so that they cannot be accidentally detached.

3.9 FRANGIBLE REQUIREMENTS

Frangible supports, couplings, and adapters shall be installed as indicated or specified.

3.10 ELEVATED AIRFIELD LIGHTS

Elevated lights shall be frangibly mounted, not to exceed 14 inches in height except where higher mounting is permitted in snow accumulation areas. Equipment exceeding 14 inches in height shall be frangibly mounted as indicated.

3.11 SEMIFLUSH AIRFIELD LIGHTS

Water, debris, and other foreign substances shall be removed prior to installing semiflush light base and light. Positioning jigs shall be used to hold the light bases and/or lights to ensure correct orientation and leveling until the concrete, adhesive, or sealant can provide permanent support.

3.12 WIRES, FIXTURES, AND ENCLOSURES IN SAW KERFS AND DRILLED HOLES (NOT USED)

3.13 SPLICES FOR AIRFIELD LIGHTING CABLE

3.13.1 Connectors

Kit type connectors shall be used to splice 5 kV single-conductor series lighting cables. During installation and prior to covering with earth, mating surfaces of connectors shall be covered until connected and clean when plugged together. At joint where connectors come together, heat shrinkable tubing shall be installed with waterproof sealant with two half-lapped layers of tape over the entire joint. Joint shall prevent

entrapment of air which might subsequently loosen the joint.

3.14 GROUNDING SYSTEMS

3.14.1 Counterpoise Installation

Counterpoise wire shall be laid for entire length of circuits supplying airfield lighting. Wire shall be in one piece, except where distance exceeds the length usually supplied. Counterpoise shall be installed on top of the envelope of concrete-encased duct and approximately 6 inches above direct burial cables and duct lines. Where trenches or duct lines intersect, counterpoise wires shall be electrically interconnected by exothermic welding or brazing. Counterpoise to earth ground shall be connected at every 1,000 feet of cable run **[AM #1]**_____by means of ground rods as specified. Counterpoise shall be installed in a separate duct under paved areas above the highest duct containing electrical or communications circuits. **[AM #1] The counterpoise shall not run through manholes, hand holes, pullboxes, or lighting cans. The counterpoise shall run around manholes, hand holes, pullboxes, and lighting cans. The counterpoise shall not be connected to the system ground.**

3.14.2 Fixture Grounding

Each fixture or group of adjacent fixtures shall be grounded by a grounding circuit separate from the counterpoise system unless required otherwise or by driven ground rods if permitted. Fixtures, steel light bases or grounding bushings on steel conduits shall be connected to an independent ground rod by a No. 6 AWG bare stranded copper wire. Semiflush fixtures for direct mounting in pavement need not be grounded. Copper wire shall be connected to ground rods by exothermic weld or brazing.

3.15 MARKING AND LIGHTING OF AIRWAY OBSTRUCTIONS (NOT USED)3.16 AIRFIELD ROTATING LIGHT BEACON (NOT USED)3.17 HELIPORT LIGHT BEACON (NOT USED)
3.18 WIND DIRECTION INDICATORS (NOT USED)

3.19 ISOLATION TRANSFORMERS

Transformer lead connections shall conform to FAA AC 150/5345-26. Transformer secondary connectors shall plug directly into a mating connector on the transformer secondary leads. During installation, mating surfaces of connectors shall be covered until connected and clean when plugged together. At joint where connectors come together, heat shrinkable tubing shall be installed with waterproof sealant or with two half-lapped layers of tape over the entire joint. Joint shall prevent entrapment of air which might subsequently loosen the joint.

3.20 RUNWAY AND TAXIWAY LIGHTING SYSTEMS

3.20.1 Existing Relocated Threshold and Taxiway Edge Lights

Edge lights shall be elevated type lights except in paved areas where semiflush lights are required.

A new light base shall be provided for each relocated light and transformer as indicated. In making cable connections, sufficient slack cable shall be provided in each base to permit connection to the upper

part of the base or as indicated. Threshold and taxiway end lights shall be type as indicated on the contract drawings. Elevated lights shall be frangibly mounted and each light supplied power through an isolation transformer. The taxiway lights shall be omnidirectional and only require leveling. The runway lights require leveling and alignment of the beams for the correct toe-in of the beams.3.21 APPROACH LIGHTING SYSTEMS (NOT USED)

3.22 FIELD QUALITY CONTROL

The Contracting Officer shall be notified five working days prior to each test. Deficiencies found shall be corrected and tests repeated.

3.22.1 Operating Test

Each completed circuit installation shall be tested for operation. Equipment shall be demonstrated to operate in accordance with the requirements of this Section. One day and one night test shall be conducted for the Contracting Officer.

3.22.2 Distribution Conductors, 600-Volt Class

Test shall verify that no short circuits or accidental grounds exist using an instrument which applies a voltage of approximately 500 volts providing a direct reading in resistance.

3.22.3 Counterpoise System Test and Inspection

Continuity of counterpoise system shall be visually inspected at accessible locations. **[AM #1]**

3.22.4 Progress Testing for Series Lighting Circuits

A megger test shall be conducted on each section of circuit or progressive combinations of sections as they are installed. Each section or progressive combination of sections shall be tested with a megohmmeter providing a voltage of approximately 1000 volts, a direct reading in resistance. Results shall be documented. Faults indicated by these tests shall be eliminated before proceeding with the circuit installation.

3.22.5 Electrical Acceptance Tests

Acceptance tests shall be performed for series and multiple airfield and heliport lighting circuits only on complete lighting circuits. Each series and multiple lighting circuit shall receive a high voltage insulation test.

3.22.5.1 Low-Voltage Continuity Tests

Each series circuit shall be tested for electrical continuity. Faults indicated by this test shall be eliminated before proceeding with the high-voltage insulation resistance test.

3.22.5.2 High-Voltage Insulation Resistance Tests

Each series lighting circuit shall be subjected to a high-voltage insulation resistance test by measurement of the insulation leakage current

with a suitable high-voltage test instrument which has a steady, filtered direct current output voltage and limited current. High-voltage tester shall include an accurate voltmeter and microammeter for reading voltage applied to the circuit and resultant insulation leakage current. Voltages shall not exceed test values specified below.

a. Test Procedure: Both leads shall be disconnected from regulator output terminals and support so that air gaps of several inches exist between bare conductors and ground. Cable sheaths shall be cleaned and dried for a distance of 1 foot from ends of cables and exposed insulation at ends of cables. Ends of both conductors of the circuit shall be connected together and to high-voltage terminals of test equipment, and test voltage applied as specified in the following tabulation between conductors and ground for a period of 5 minutes.

	Test Voltage, dc	
Series Lighting Circuits	First Test on New Circuits	Test on Existing Circuits
High Intensity Series Lighting Circuits (5,000 volt leads, 500 and 200 watt transformers)	9000	5000
Medium Intensity Series Lighting Circuits (5,000 volt leads, 30/45 watt transformers)	6000	3000
600-Volt Circuits	1800	600

When additions are made to existing circuits, only new sections shall be tested in accordance with "First Test on New Circuits" in table above. To ensure reliable operation, complete circuit shall be tested at reduced voltages indicated above.

b. Leakage Current: Insulation leakage current shall be measured and recorded for each circuit after a 1 minute application of the test voltage. If leakage current exceeds values specified below, the circuit shall be sectionalized and retested and the defective parts shall be repaired or replaced. Leakage current limits include allowances for the normal number of connectors and splices for each circuit as follows:

(1) Three microamperes for each 1000 feet of cable.

(2) Two microamperes for each 200 watt and each 500 watt 5,000-volt series transformer.

(3) Two microamperes for each 30/45-Watt 5,000 volt series transformer.

If measured value of insulation leakage current exceeds calculated value, the circuit shall be sectionalized and tested as specified for each section. Defective components shall be repaired or replaced until repeated tests indicate an acceptable value of leakage current for the entire circuit.

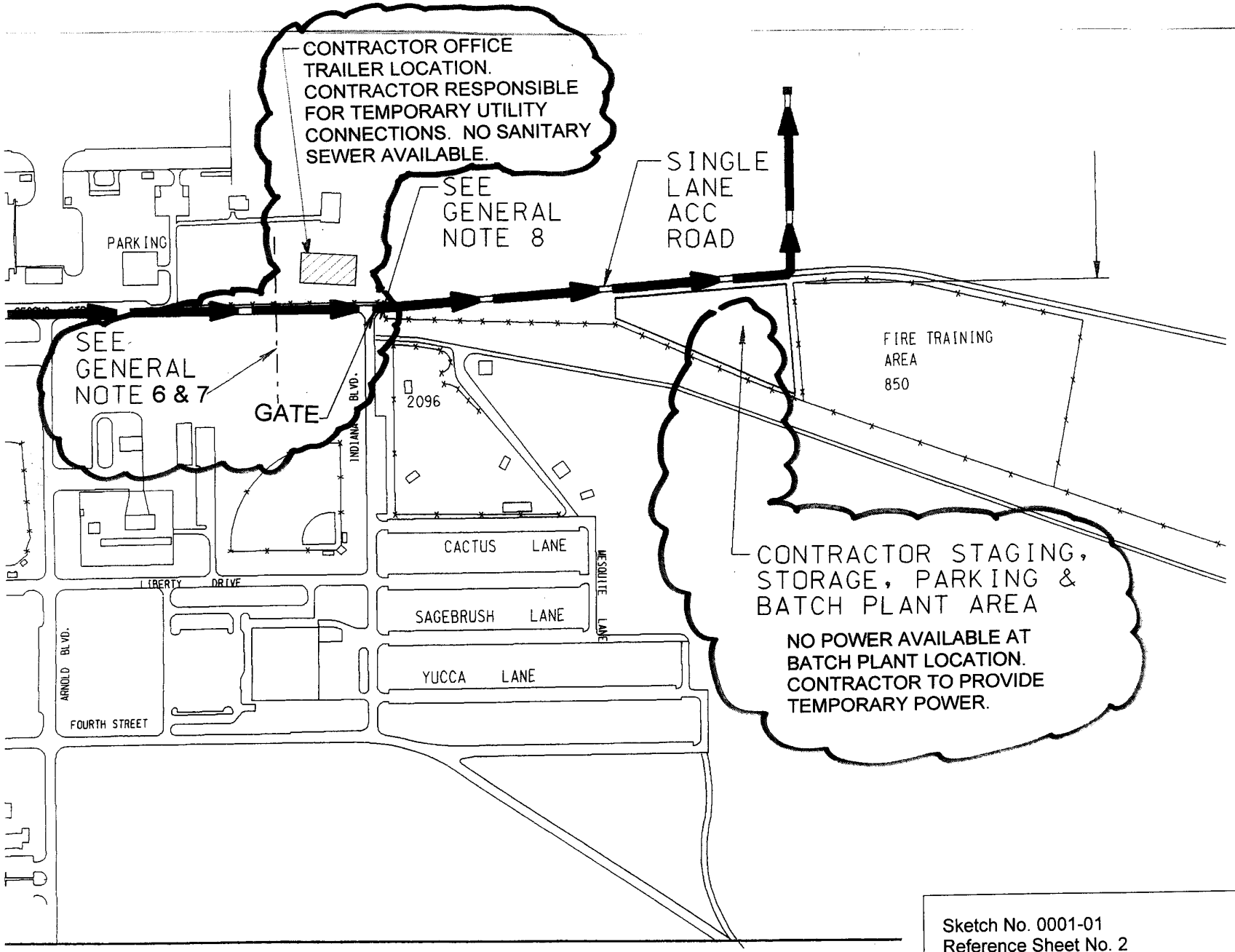
3.22.6 Constant Current Regulators (NOT USED)

3.22.7 Regulator Electrical Tests (NOT USED)

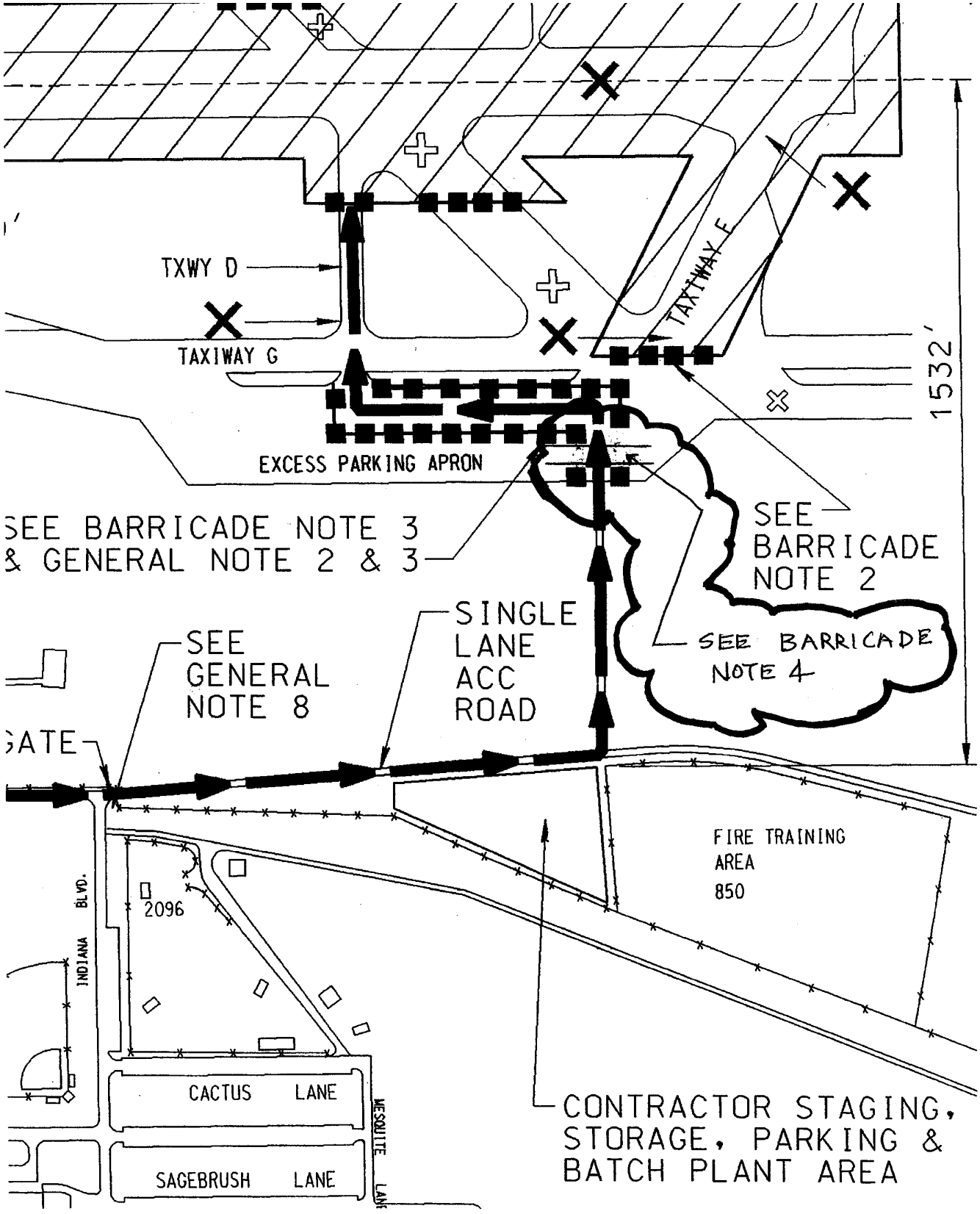
3.22.8 Final Operating Tests

After completion of installations and the above tests, circuits, control equipment, and lights covered by the contract shall be demonstrated to be in acceptable operating condition. Taxiway E switch in the control tower lighting panel shall be operated so that each switch position is engaged at least twice. During this process, lights and associated equipment shall be observed to determine that each switch properly controls the corresponding circuit. Telephone or radio communication shall be provided between the operator and the observer. Tests shall be repeated from the alternate control station, from the remote control points, and again from the local control switches on the regulators. Lighting circuit shall be tested by operating the lamps at maximum brightness for not less than 30 minutes. At the beginning and at the end of this test the correct number of lights shall be observed to be burning at full brightness. One day and one night operating test shall be conducted for the Contracting Officer.

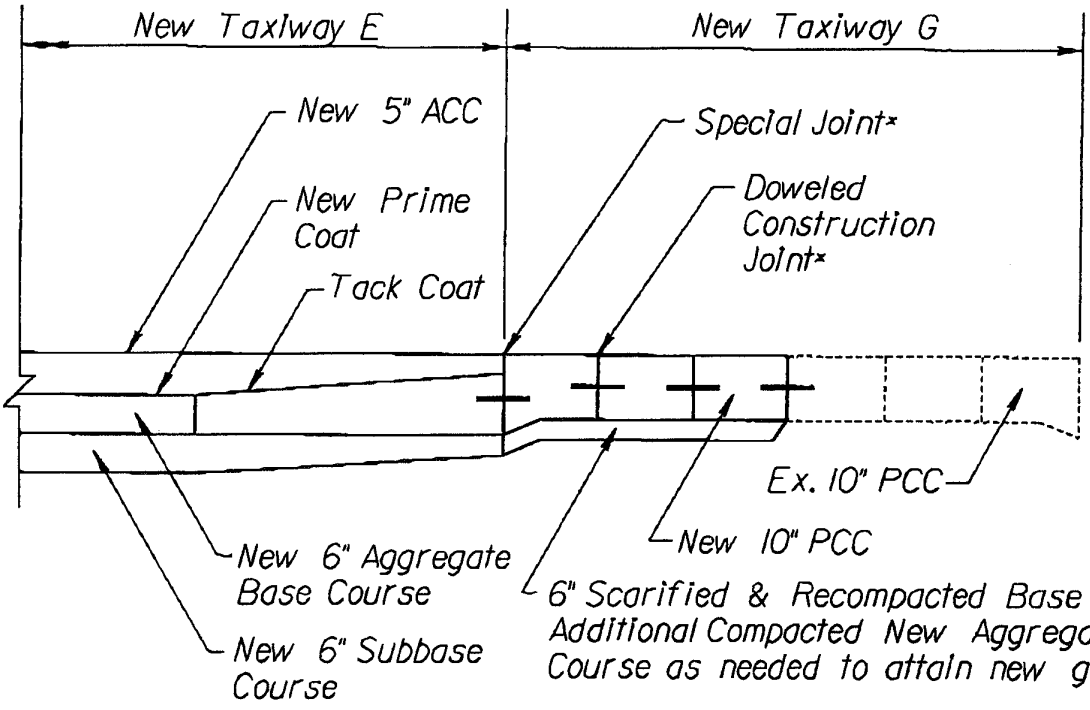
-- End of Section --



Sketch No. 0001-01
Reference Sheet No. 2
Solicitation No. DACA63-01-R-0023
Repair Inside Runway 13R – 31L
Laughlin AFB, Del Rio, Texas
Amendment No. 0001



Sketch No. 0001-02
Reference Sheet No. 2
Solicitation No. DACA63-01-R-0023
Repair Inside Runway 13R – 31L
Laughlin AFB, Del Rio, Texas
Amendment No. 0001



*See Sheet C-36 for Joint Details

TAXIWAY E/TAXIWAY G INTERSECTION

NO SCALE

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Sketch No. 0001-03
Reference Sheet No. C-36
Solicitation No. DACA63-01-R-0023
Repair Inside Runway 13R – 31L
Laughlin AFB, Del Rio, Texas
Amendment No. 0001